ORDER NO. FTD971105387 G30

Service Manual

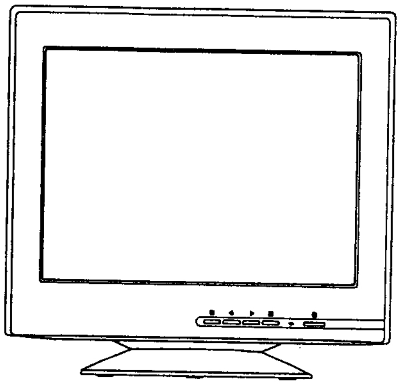
Multi-Scan Color CRT Display

PanaSync S110

MODEL TX-D1F63-M/-U/-SW/-E/-G

Chassis No. HV10S

Chassis Family No.21HV10S



Suffix of Each Model and Destination

-M	North America	(Power Cord:UL/CSA type	No. TSXA023 enclosed)
-U	U.K.	(Power Cord:U.K. type	No. TSX8493 enclosed)
-SW	Switzerland	(Power Cord:SEV type	No. TSX8492 enclosed)
-E	Germany	(Power Cord:VDE type	No. TSX8484 enclosed)
-G	Other Europe and Asia	(Power Cord:VDE type	No. TSX8484 enclosed)

CONTENTS

SERVICE WARNING 1
SAFETY PRECAUTIONS 2
GENERAL INFORMATION 3
SPECIFICATIONS 3
DIMENSIONS 13
DISASSEMBLY INSTRUCTIONS 15
CONTROL LOCATION 18
CAUTION FOR ADJUSTMENT AND REPAIR 19
CAUTION FOR SERVICING 19
ADJUSTMENT AND CHECK PROCEDURE 20
ADJUSTMENT SOFTWARE 22
ADJUSTMENT CONTROL LOCATION 23
REQUIRED ADJUSTMENT PROCEDURE AFTER A PARTS REPLACED 24
ADJUSTMENT PROCEDURE 25
BLOCK DIAGRAM 35
CONDUCTOR VIEW 42
SCHEMATIC DIAGRAM 45
TROUBLE SHOOTING HINTS 56
EXPLODED VIEW 64

Panasonic

⚠WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.

It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.

Products powered by electricity should be serviced or repaired only by experienced professional technicians.

Any attempt to service or repair the product or products dealt within this service information by anyone else could result in serious injury or death.

SAFETY PRECAUTIONS

1 CAUTION:

No modification of any circuit should be attempted. Service work should only be performed after you are thoroughly familiar with all of the following safety checks and servicing guide lines.

2 SAFETY CHECK

Care should be taken while servicing this CRT display because of the high voltage used in the deflection circuits. These voltages are exposed in such areas as the associated flyback and yoke circuits.

3 FIRE & SHOCK HAZARD

3-1 Insert an isolation transformer between the CRT display and AC power line before servicing the chassis.

3-2 In servicing pay attention to original lead dress especially in the high voltage circuit. If a short circuit is found, replace all parts which have been overheated as a result of the short circuit.

3-3 All the protective devices must be reinstalled per original design.

3-4 Soldering must be inspected for possible cold solder joints, frayed leads, damaged insulation, solder splashes or sharp solder points. Be certain to remove all foreign material.

4 LEAKAGE CURRENT COLD CHECK

4-1 Unplug the AC cord and connect a jumper between the two prongs on the plug.

4-2 Turn the CRT display power switch "on" .

4-3 Measure the resistance value with an ohmmeter between the jumpered AC plug and each exposed metallic part on the CRT display such as the metal frame, screwheads, control shafts, etc. When the exposed metallic part has a return path to the chassis, the reading should be 1.8 megohm minimum.

5 LEAKAGE CURRENT HOT CHECK

5-1 Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during this check.

5-2 Connect a 1500 ohm, 10 watt resistor, paralleled by a 0.15μF capacitor between each exposed metallic part and a good earth ground (as shown in Fig.1).

5-3 Use an AC voltmeter with 1000 ohm/volt or more sensitivity and measure the AC voltage across the combination 1500 ohm resistor and 0.15μF capacitor.

5-4 Move the resistor connection to each exposed metallic part and measure the voltage.

5-5 Reverse the polarity of the AC plug in the AC outlet and repeat the above measurement.

5-6 Voltage measured must not exceed 7.5 volt RMS, from any exposed metallic part to ground A leakage current tester may be used in the above hot check, in which case any current measured must not exceed 5.0 milliamp. In the case of a measurement exceeding the 5.0 milliamp value, a rework is required to eliminate the chance of a shock hazard.

Note: High voltage is present when this CRT display is operating. Always discharge the anode of the picture tube to the display chassis to prevent shock hazard.

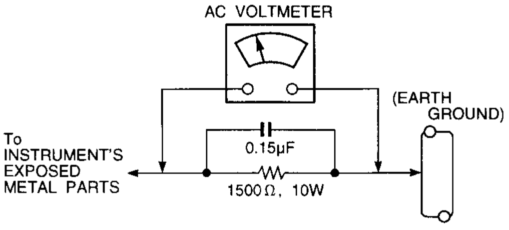


Fig.1

6 IMPLOSION PROTECTION

Picture tubes are equipped with an integral implosion protection system, but care should be taken to avoid damage and scratching during installation. Use only Panasonic replacement picture tubes.

7 X-RADIATION

WARNING : The only potential source of X-Radiation is the picture tube. However when the high voltage circuitry is operating properly there is no possibility of X-Radiation problem. The basic precaution which must be exercised is to keep the high voltage at the following factory-recommended level.

Note: It is important to use an accurate periodically calibrated high voltage meter.

7-1 The procedure for adjustment high voltage is as shown on page 23.

7-2 If can not be adjust 24.5 kV at immediate service is required to prevent the possibility of premature component failure.

7-3 To prevent X-Radiation possibility it is essential to use the specified picture tube.

IMPORTANT SAFETY NOTICE

There are special components used in this CRT displays which are important for safety. These parts are identified by the international symbol ⚠ on the schematic diagram and on the replacement parts list. It is essential that these critical parts should be replaced with manufacture's specified parts to prevent X-RADIATION, shock, fire or other hazards. Do not modify the original design or this will void the original parts and labor guarantee.

GENERAL INFORMATION

1. OUTLINE

This monitor is 21 inch (20.0viewable)multi-scan color CRT display with the following features.
IIC Bus Micro processor & Enhanced OSD are newly introduced, which optimize the function.

2. FEATURES

2-1 SSP-Lite LSI (Advanced Super Signal Processor) mounted
Precise wave forms are generated for the correction of each geometric distortion.

2-2 Power Saving
Built-in Power Saving function based on VESA-DPMS standard.
Power energy shall be saved by controlling the circuit in accordance with power saving signal from computer.

2-3 OSD (on screen display) function
OSD (5 languages & multi location) is new and excellent man-machine interface.
Anyone is able to set up the picture as he likes through icon & four keys in front bezel.

2-4 Self Test function
Self testing picture comes out by pushing any key in the case of no-connection with computer or power saving operation.
This function shows if monitor is alive or not and can be used for self aging test.

2-5 Ergonomic design

- Low emission design to meet MPR II & TCO'92
- ESF (Electro static field) free coating on CRT
- Tilt & swivel stand is mounted

2-6 Multi scan with digital technology
8 bit micro computer controls the circuit operation to meet with wide range signal of f_H=30~95 kHz and f_V =50~180 Hz.
So VGA, SVGA, XGA(1024x768), SXGA (1280x1024) and UXGA (1600x1200) are applicable.

2-7 1 Factory presets, (+7 Reservation), 13 user memories.

- 1 standard mode is preset at the factory.
- 7 modes are reserved at the factory.
- 13 user memories are available to set the user's own timing and display information.

2-8 Flat Face and fine dot pitch
Flat face CRT with fine dot pitch of 0.25 mm (Horizontal:0.218mm / Vertical:0.130mm)gives a crispy and comfortable sight of the screen.

2-9 Superior display performance

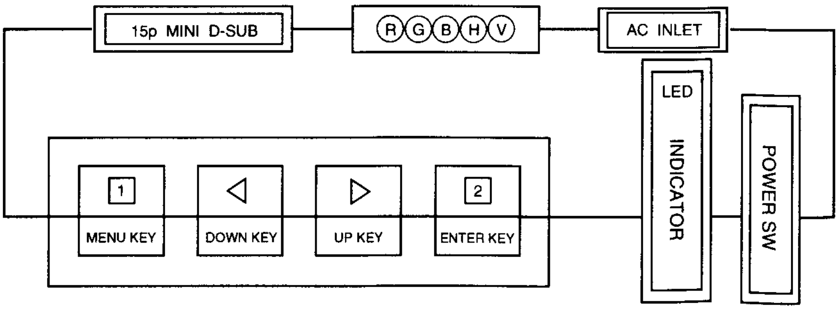
- Good focus by sophisticated gun and dynamic focus circuit
- High contrast
- Minimized distortion by digital correction circuit
- Good convergence
- Users enjoy full scan image for graphics .

2-10 Special function

- VESA DDC1/2B (Display Data Channel) compatible
- Rotation control circuit
- Multi color:9300k, 7500k & 6500k & 5000k are preset at the factory
- MOIRE Reduction circuit

SPECIFICATION

1. DIAGRAM



1.1 POWER SW, LED, $\boxed{1}$-key (MENU), ◁-key (DOWN), ▷-key (UP), and $\boxed{2}$-key (ENTER) are located on the front panel.
1.2 Signal cable and AC inlet are located on the back side of the cabinet.
1.3 OSD menu includes the following function.

CONTRAST
BRIGHTNESS
SIZE & POSITION
GEOMETRY
ROTATION
COLOR SELECT
RECALL
VIDEO INPUT LEVEL
H.MOIRE
V.MOIRE
LANGUAGE
OSD POSITION
DEGAUSS
SIGNAL

※) CONTRAST can be directly controlled with ◁/▷-key.
※) With sync signal, OSD menu appears by pushing $\boxed{1}$-key and $\boxed{2}$-key.
Without sync signal, self test menu appears by pushing any key.
※) Size & Posi·········H.POSITION, H.SIZE, V.POSITION, V.SIZE
※) GEOMETRY·········V.PINCUSHION/ BALANCE, TRAPEZOID, PARALLELOGRAM
※) Video clamp pulse phase can be changed by simultaneously operation for $\boxed{1}$ and $\boxed{2}$ key .

2. MECHANICAL SPECIFICATIONS

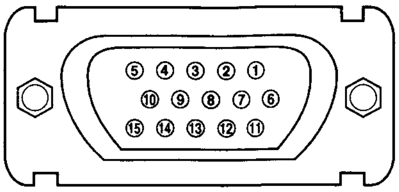
..... refer to the attached drawing

2.1 Dimension Height : 487 mm (19.2") (typ.)
Width : 505 mm (19.9") (typ.)
Depth : 519 mm (20.4") (typ.)
2.2 Net Weight : 27.5 Kg (60.5lbs) (typ.)
2.3 Maximum Viewable Phosphor Display Area:
: 508mm (20.0") (typ.)

3. CONNECTORS

3.1 Signal connector:
15P Mini D-Sub 15P and BNC (R. G. B. H. V)
3.2 AC inlet: CEE 22 typed connector

<15P Mini D-Sub 15P PIN assignment>



1 ... RED
2 ... GREEN
3 ... BLUE
4 ... GROUND
5 ... GROUND (DDC)
6 ... GROUND
7 ... GROUND
8 ... GROUND
9 ... - (OPEN)
10 ... GROUND
11 ... GROUND
12 ... SDA (DDC)
13 ... H. SYNC.
14 ... V. SYNC.
15 ... SCL (DDC)

4. CRT SPECIFICATIONS

Part No.	M51KYY540X
Type	21", 90°, 29ø.in-line gun (Viewable20.0"),
Dot Pitch	Hrizontal:0.218mm/Vartical:0.130mm
Phosphor	R, G, B short persistence(Hi-Eu RED)
	Red x=0.635 typ, y=0.333 typ Green x=0.280 typ, y=0.595 typ Blue x=0.152 typ, y=0.063 typ
Bulb	DARK TINT
Face coating	NEW AGRAS COAT
Total Transmission	39.5%

5. ELECTRICAL SPECIFICATIONS

5.1 Standard conditions ... Except special items

Display image	Green, full "H" characters with a border line. (7 x 9 dots) Video signal : 100% duty Display area : 392 mm x 294 mm
Video signal level	0.7 V pp
Contrast, Brightness	Contrast : Max., Brightness : detent point
Ambient Temperature	20±5°C (68 ± 9°F)
Input Voltage	AC 120 V, 60 Hz or AC 220 V, 50 Hz
Terrestrial magnetism	Vertical field : northern hemisphere field 40μT Horizontal field : no field
Viewing direction	Parallel to the CRT axis
Measurements	After an initial warming up time of more than 30 minutes.
Ambient light	200±50 IX
Display mode	1600 x 1200 (93.75 kHz, 75.00 Hz)

5.2 POWER

5.2.1 Power supply ... Commercial power source

Input voltage	AC 90 - 132 V, AC 198 - 264 V
Power frequency	50 Hz ± 3 Hz, 60 Hz ± 3 Hz
Input current	2.7 A Max. (100 V)
Inrush current (at 20° C)	40 A op note:Cold Start
Power consumption	145 W Typ.160 W max.(AC 100V)

5.2.2 Power Management for Power Saving ...

Power saving system is designed based upon VESA DPMS standard (Version : 1.0)

1) Power consumption and recovery time.

*1 APM State	SIGNALS			MONITOR POWER CONSUMP-TION	RECOVERY TIME TO ON STATE	INDICATOR
	H. Sync	V. Sync	VIDEO			
ON	*3 NOR-MAL	*3 NOR-MAL	*2 ACTIVE	*4 100%	——	Green
STAND-BY	No Sync or *5 < 10 Hz	> 40 Hz	BLANK	< 15 W	< 4 sec.	Yellow
SUS-PEND	>10 kHz	No Sync or *5 < 10 Hz	BLANK	< 15 W	< 4 sec.	Yellow
OFF	No Sync or *5 < 10 Hz	No Sync or *5 < 10 Hz	BLANK	< 4 W	< 20sec	Yellow

** The transition time from ON state to each APM states is 5 seconds minimum.

*1 : APM : Advanced Power Management.

*2 : Measyrement Condition of power consumption for ON state :
DISPLAY IMAGE : WHITE full "H" characters (7 × 9 dots).

*3 : NORMAL : See "5.4 ACCEPTABLE TIMING".

*4 : Power Consumption is measured at AC 100-240V. (Note:3w Typ. at AC 230V/50Hz)

*5 : Power saving operation is done at least less than specified value in the list.

5.3 Standard timing (Standard mode)

- Following 1 mode is preset in the memory as standard timing at the factory and 7 modes are reserved.
- Fig-1 shows a definition of timing and signal level.
- Electrical performance is specified This SPECIFICATION is specified at STD (1600 x 1200) mode unless otherwise mentioned.

TIMING CHART

A	Period
B	Blanking
C	Sync Width
D	Back Porch
E	Active
F	Front Potch

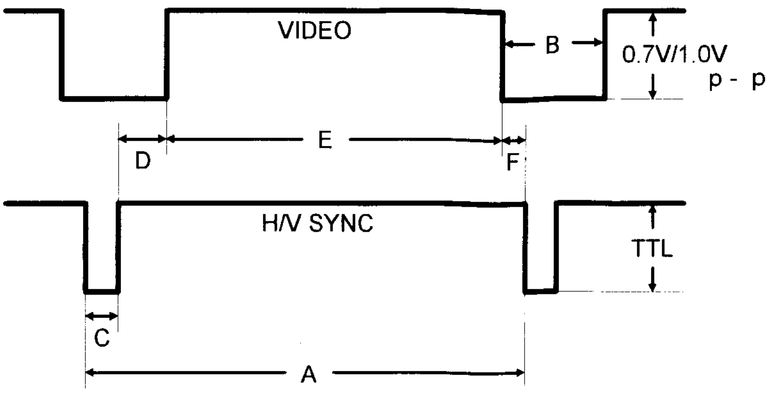


Fig.1

		PRESET	RESERVATION	RESERVATION
		MODE - 1	MODE - 2	MODE - 3
		1600 × 1200 (75)	640 × 480 (60)	800 × 600 (75)
DOT CLOCK		202.5000 MHz	25.1750 MHz	49.5000 MHz
H	f H	93.7500 kHz	31.4688 kHz	46.8750 kHz
	A - PERIOD	10.667 μs (2,160 dots)	31.778 μs (800 dots)	21.333 μs (1,056 dots)
	B - BLANKING TIME	2.765 μs (560 dots)	6.356 μs (160 dots)	5.172 μs (256 dots)
	C - SYNC WIDTH	0.948 μs (192 dots)	3.813 μs (96 dots)	1.616 μs (80 dots)
	D - BACK PORCH	1.501 μs (304 dots)	1.946 μs (49 dots)	3.232 μs (160 dots)
	E - ACTIVE TIME	7.901 μs (1,600 dots)	25.422 μs (640 dots)	16.162 μs (800 dots)
	F - FRONT PORCH	0.316 μs (64 dots)	0.596 μs (15 dots)	0.323 μs (16 dots)
V	f V	75.0000 Hz	59.9405 Hz	75.0000 Hz
	A - PERIOD	13.333 ms (1,250 lines)	16.683 ms (525 lines)	13.333 ms (625 lines)
	B - BLANKING TIME	0.533 ms (50 lines)	1.430 ms (45 lines)	0.533 ms (25 lines)
	C - SYNC WIDTH	0.032 ms (3 lines)	0.064 ms (2 lines)	0.064 ms (3 lines)
	D - BACK PORCH	0.491 ms (46 lines)	1.176 ms (37 lines)	0.448 ms (21 lines)
	E - ACTIVE TIME	12.800 ms (1,200 lines)	15.253 ms (480 lines)	12.800 ms (600 lines)
	F - FRONT PORCH	0.011 ms (1 lines)	0.191 ms (6 lines)	0.021 ms (1 lines)
SYNC POLARITY(H/V)		Positive / Positive	Negative / Negative	Positive / Positive

		RESERVATION	RESERVATION	RESERVATION
		MODE - 4	MODE - 5	MODE - 6
		1024 × 768 (75)	MAC 1152 × 870 (75)	1280 × 1024 (60)
DOT CLOCK		78.7500 MHz	100.0000 MHz	108.5000 MHz
H	f H	60.0229 kHz	68.6813 kHz	63.9741 kHz
	A - PERIOD	16.660 μs (1,312 dots)	14.560 μs (1,456 dots)	15.631 μs (1,696 dots)
	B - BLANKING TIME	3.657 μs (288 dots)	3.040 μs (304 dots)	3.834 μs (416 dots)
	C - SYNC WIDTH	1.219 μs (96 dots)	1.280 μs (128 dots)	1.180 μs (128 dots)
	D - BACK PORCH	2.235 μs (176 dots)	1.440 μs (144 dots)	2.065 μs (224 dots)
	E - ACTIVE TIME	13.003 μs (1,024 dots)	11.520 μs (1,152 dots)	11.797 μs (1,280 dots)
	F - FRONT PORCH	0.203 μs (16 dots)	0.320 μs (32 dots)	0.590 μs (64 dots)
V	f V	75.0286 Hz	75.0616 Hz	60.0132 Hz
	A - PERIOD	13.328 ms (800 lines)	13.322 ms (915 lines)	16.663 ms (1,066 lines)
	B - BLANKING TIME	0.533 ms (32 lines)	0.655 ms (45 lines)	0.657 ms (42 lines)
	C - SYNC WIDTH	0.050 ms (3 lines)	0.044 ms (3 lines)	0.047 ms (3 lines)
	D - BACK PORCH	0.466 ms (28 lines)	0.568 ms (39 lines)	0.594 ms (38 lines)
	E - ACTIVE TIME	12.795 ms (768 lines)	12.667 ms (870 lines)	16.006 ms (1,024 lines)
	F - FRONT PORCH	0.017 ms (1 lines)	0.044 ms (3 lines)	0.016 ms (1 lines)
SYNC POLARITY(H/V)		Positive / Positive	Negative / Negative	Positive / Positive

		RESERVATION	RESERVATION
		MODE - 7	MODE - 8
		1280 × 1024 (75)	1600 × 1200 (70)
DOT CLOCK		135.0000 MHz	189.0000 MHz
H	f H	79.9763 kHz	87.5000 kHz
	A - PERIOD	12.504 µs (1,688 dots)	11.429 µs (2,160 dots)
	B - BLANKING TIME	3.022 µs (408 dots)	2.963 µs (560 dots)
	C - SYNC WIDTH	1.067 µs (144 dots)	1.016 µs (192 dots)
	D - BACK PORCH	1.837 µs (248 dots)	1.608 µs (304 dots)
	E - ACTIVE TIME	9.481 µs (1,280 dots)	8.466 µs (1,600 dots)
	F - FRONT PORCH	0.119 µs (16 dots)	0.339 µs (64 dots)
V	f V	75.0247 Hz	70.0000 Hz
	A - PERIOD	13.329 ms (1,066 lines)	14.286 ms (1,250 lines)
	B - BLANKING TIME	0.525 ms (42 lines)	0.571 ms (50 lines)
	C - SYNC WIDTH	0.038 ms (3 lines)	0.034 ms (3 lines)
	D - BACK PORCH	0.475 ms (38 lines)	0.526 ms (46 lines)
	E - ACTIVE TIME	12.804 ms (1,024 lines)	13.714 ms (1,200 lines)
	F - FRONT PORCH	0.013 ms (1 lines)	0.011 ms (1 lines)
SYNC POLARITY(H/V)		Positive / Positive	Positive / Positive

		ADJUSTMENT	ADJUSTMENT	ADJUSTMENT
		HV10S - 1	HV10S - 2	HV10S - 3
DOT CLOCK		22.5900 MHz	91.6240 MHz	160.6320 MHz
H	f H	29.1108 KHz	52.1777 KHz	75.2022 KHz
	A - PERIOD	34.351 µs (776 dots)	19.165 µs (1,756 dots)	13.297 µs (2,136 dots)
	B - BLANKING TIME	6.906 µs (156 dots)	4.235 µs (388 dots)	3.187 µs (512 dots)
	C - SYNC WIDTH	3.320 µs (75 dots)	1.746 µs (160 dots)	1.145 µs (184 dots)
	D - BACK PORCH	2.258 µs (51 dots)	1.768 µs (162 dots)	1.544 µs (248 dots)
	E - ACTIVE TIME	27.446 µs (620 dots)	14.931 µs (1,368 dots)	10.110 µs (1,624 dots)
	F - FRONT PORCH	1.328 µs (30 dots)	0.720 µs (66 dots)	0.498 µs (80 dots)
V	f V	47.4891 Hz	92.3499 Hz	137.2304 Hz
	A - PERIOD	21.057 ms (613 lines)	10.828 ms (565 lines)	7.287 ms (548 lines)
	B - BLANKING TIME	0.927 ms (27 lines)	0.556 ms (29 lines)	0.426 ms (32 lines)
	C - SYNC WIDTH	0.103 ms (3 lines)	0.057 ms (3 lines)	0.040 ms (3 lines)
	D - BACK PORCH	0.721 ms (21 lines)	0.479 ms (25 lines)	0.372 ms (28 lines)
	E - ACTIVE TIME	20.130 ms (586 lines)	10.273 ms (536 lines)	6.861 ms (516 lines)
	F - FRONT PORCH	0.103 ms (3 lines)	0.019 ms (1 lines)	0.013 ms (1 lines)
SYNC POLARITY(H/V)		Negative / Negative	Negative / Negative	Negative / Negative

		ADJUSTMENT
		HV10S - 4
DOT CLOCK		230.1100 MHz
H	f H	96.5227 KHz
	A - PERIOD	10.360 µs (2,384 dots)
	B - BLANKING TIME	2.694 µs (620 dots)
	C - SYNC WIDTH	0.834 µs (192 dots)
	D - BACK PORCH	1.495 µs (344 dots)
	E - ACTIVE TIME	7.666 µs (1,764 dots)
	F - FRONT PORCH	0.365 µs (84 dots)
V	f V	182.1182 Hz
	A - PERIOD	5.491 ms (530 lines)
	B - BLANKING TIME	0.363 ms (35 lines)
	C - SYNC WIDTH	0.031 ms (3 lines)
	D - BACK PORCH	0.321 ms (31 lines)
	E - ACTIVE TIME	5.128 ms (495 lines)
	F - FRONT PORCH	0.010 ms (1 lines)
SYNC POLARITY(H/V)		Negative / Negative

5.4 Acceptable timing

- If your timing is within following specification, this CRT display can automatically function with a certain size and position.

Horizontal: Sync frequency: 30.0 ~ 95.0 kHz
Blanking Time: ≥ 2.7 μs
Back Porch: ≥ 1.25 μs
Front Porch: ≤ Back Porch
Sync Width : 0.948 ~ 4.0μs(f_{H}<50KHz)
0.948 ~ 2.5μs(f_{H}>50KHz)

Vertical: Sync frequency: 50.0 ~ 180.0 Hz
Blanking Time: ≥ 0.5 ms
Back Porch: ≥ 0.4 ms
Sync Width: ≥ 0.032 ms

- Several items like size, position and distortion can be adjusted through OSD menu, and if you want to keep it, please push the key $\boxed{1}$ for memory, or keep the key untouched for about 20 seconds, it is automatically memorized.

NOTE : In case of RECALL, the key is untouched for about 30 seconds, RECALL function will be cancelled.

Please note, however, that there is the case you can not get the size and/or position you want, (for example, in case Display video Time is too short, you can't get bigger size of the image.)

- The CRT adopted in this CRT display is designed to minimize the moire phenomenon at suitable size for typical display modes. However, there might be a display format among many formats, in which the moire phenomenon appears on this display.

5.5 Signal level and input impedance

5.5.1 Video Signal level

- This CRT display is adjusted at the factory using 0.7Vpp Video Signal. Black level is 0 V.
- This CRT display is compatible with 1.0Vpp Video signal by using Video input level selection.

5.5.2 Sync Signal level

- H/V Separate, H/V Mixed : TTL level
- Sync on Green : 0.3 V p-p ±0.015V

5.5.3 Input impedance

- Video input: 75 Ω
- Sync input: ≥ 1 kΩ

5.6 Display performance

5.6.1 Display area

1) PRESET TIMING
MODE 1,1600×1200 @75Hz
WIDTH : 392 mm ± 5 mm
HEIGHT : 294 mm ± 5 mm

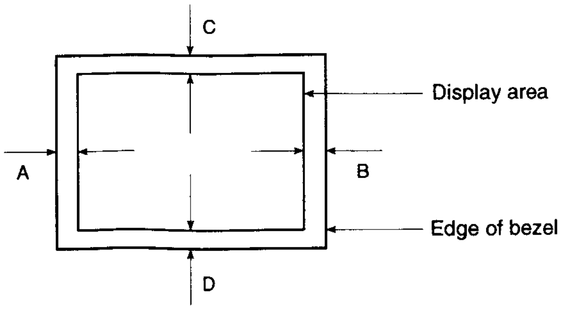
2) RESERVATION TIMING
MODE 2, 640× 480 @60Hz
WIDTH : 392 mm ± 7 mm
HEIGHT : 294 mm ± 7 mm
MODE 3, 800× 600 @75Hz
WIDTH : 392 mm ± 7 mm
HEIGHT : 294 mm ± 7 mm
MODE 4,1024× 768 @75Hz
WIDTH : 392 mm ± 7 mm
HEIGHT : 294 mm ± 7 mm
MODE 5,1152× 870 @75Hz
WIDTH : 392 mm ± 7 mm
HEIGHT : 294 mm ± 7 mm
MODE 6,1280×1024 @60Hz
WIDTH : 368 mm ± 7 mm
HEIGHT : 294 mm ± 7 mm
MODE 7,1280×1024 @75Hz
WIDTH : 368 mm ± 7 mm
HEIGHT : 294 mm ± 7 mm
MODE 8,1600×1200 @70Hz
WIDTH : 392 mm ± 7 mm
HEIGHT : 294 mm ± 7 mm

3) FULL SCAN
WIDTH : 406 mm
HEIGHT : 304 mm

5.6.2 Centering

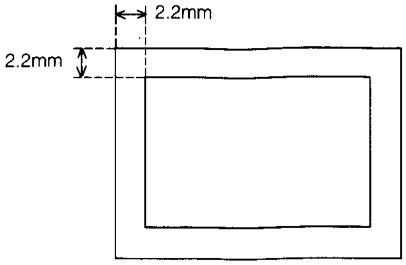
1) PRESET TIMING (MODE1)
$|A - B| \leq 4$ mm
$|C - D| \leq 4$ mm

2) RESERVATION TIMING (MODE2~8)
$|A - B| \leq 7$ mm
$|C - D| \leq 7$ mm



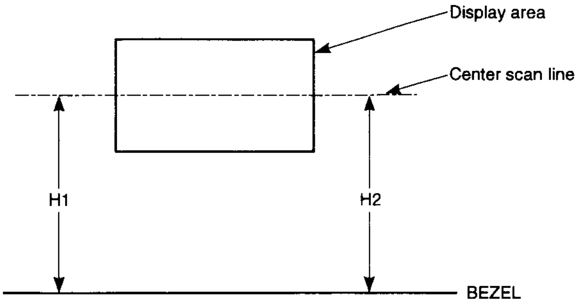
5.6.3 Distortion

Inside 2.2 mm Freme



5.6.4 Rotation

$|H1 - H2| \leq 2.5$ mm



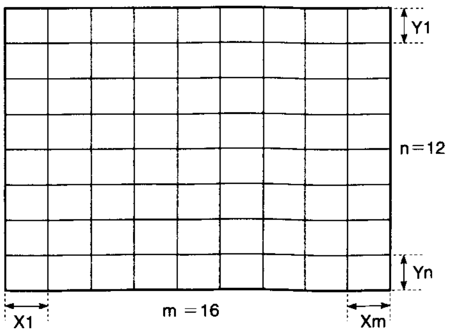
5.6.5 Linearity

Horizontal linearity

$$= \frac{X\,max. - X\,min.}{X\,max. + X\,min.} \times 100\% \leq 7\%$$

Vertical linearity

$$= \frac{Y\,max. - Y\,min.}{Y\,max. + Y\,min.} \times 100\% \leq 6\%$$



<Conditions>

Display image ------- crosshatch pattern

Maximum and minimum values should not be adjacent to each other.

X max. is maximum value among X1~Xm

X min. is minimum value among X1~Xm

Y max. is maximum value among Y1~Yn

Y min. is minimum value among Y1~Yn

5.7 General performance

5.7.1 Maximum Pixel Clock

202.5 MHz (Typ.)

5.7.2 Maximum luminance

Value	95 cd/m² (Typ.) for 5% white field at the center of the display area. 85 cd/m² (Typ.) for 100% white field at the center of the display area. Specified by 9300 K + 8 MPCD
Conditions	Display image : White full flat field Luminance : Max. (Contrast : Max.) (Brightness :CENTER point)

5.7.3 Minimum luminance

Value	≤ 17 cd/m² at the center of the display area. Specified by 9300 K + 8 MPCD
Conditions	Display image : White full flat field Luminance : Min. (Contrast : Min.) (Brightness : CENTER point)

5.7.4 Brightness variation

Value	75 % (Min.) Variation = C/A X 100
Conditions	Display image : White full flat field Luminance : MAX (Contrast : MAX) (Brightness : Center point) A ; Luminance at center position C ; Luminance at position of lowest brightness

5.7.5 Display area regulation

	Display area variation	Range of variation
Due to Luminance	within 1.0 %	17~95 cd/m^2 (white flat field)
Due to Power Supply	within 0.5 %	AC : 90 - 132 V or 198 - 264 V
Due to Temperature	within 1.5 %	20° C ± 20° C

5.7.6 Color Point

< Conditions >

Display image : White flat field at the center of the display area.

Luminance : Brightness Center point.

Contrast	max	min
Value	9300 K + 8 MPCD x = 0.283 ± 0.020 y = 0.298 ± 0.020	9300 K + 8 MPCD x = 0.283 ± 0.020 y = 0.298 ± 0.020

< Conditions >

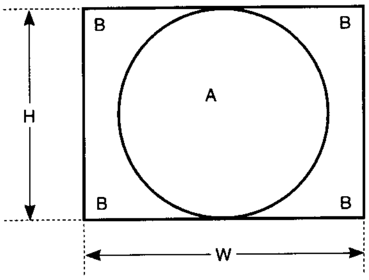
Display image : 5% White flat field at the center of the display area.

Luminance : Brightness Center point , Contrast max

Contrast	7500K	6500K	5000K
Value	x = 0.300(Typ.) y = 0.315(Typ.)	x = 0.313(Typ.) y = 0.329(Typ.)	x = 0.346(Typ.) y = 0.359(Typ.)

5.7.7 Misconvergence

Center area of display	(A) : 0.3 mm (Max.)
Corner area of display	(B) : 0.4 mm (Max.)



<Conditions>

Display image	:	Crosshatch pattern mixed with R, G and B colors.
Convergence gauge	:	KLEIN CM7AG or equivalent.
Display area	:	W x H 392 x 294 mm

5.7.8 White Uniformity

xa – xc ≤ ± 0.015

xa : x coordinate at the CRT center

xc : x coordinate at any other point

ya – yc ≤ ± 0.015

ya : y coordinate at the CRT center

ya : y coordinate at any other point

<Conditions>

Display image : White flat field

Luminance : 95 cd/m^2 at the center of display area

Display area : 392 x 294 mm

5.7.9 Purity

Conspicuous mislanding shall not be visible within display area at a distance of 60cm from CRT surface.

<Conditions>

Display image : Red/Green/Blue flat field

Luminance : Contrast max, Brightness CENTER

Display area : 392 x 294 mm

5.7.10 Jitters

Invisible at a distance of 60 cm from CRT surface.

6. ENVIRONMENTS

6.1 Ambient temperature, humidity and altitude

	Operating	Storage and shipment
Temperature	0 ~ 40° C (32 ~ 104° F)	–20 ~ +60° C (–4 ~ 140° F)
Humidity	5 ~ 90 % *	5 ~ 90 % *
Altitude	3,000 m (Max.) (10,000 ft)	12,000 m (Max.) (40,000 ft)

* Non-condensation

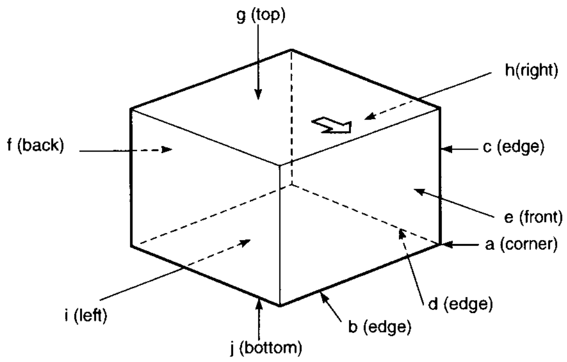
6.2 Vibration and shock

6.2.1 Vibration

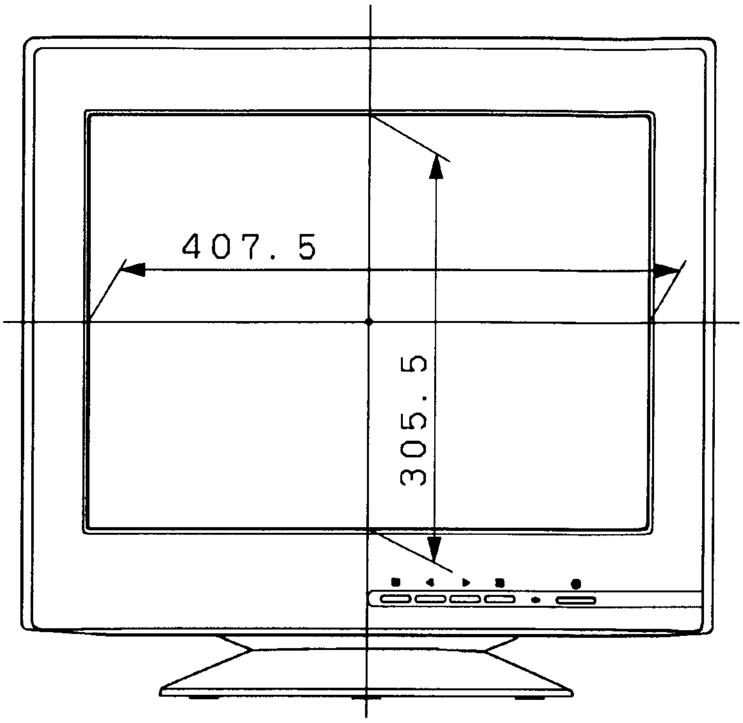
	Order of tests	Direction of vibration		Acceleration		Frequency	Sweep	Test time
				Non-operation	Storage and shipment			
Unpacked	1	Vertical	Up to down	2.9 m/s^2 (0.3 G)		5 - 55 Hz	120 s	30 min.
	2	Horizontal	Front to back					15 min.
	3		Right to left					
Packed	1	Vertical	Up to down		10m/s^2 (1.0 G)	5 - 50 Hz	810s (Logsweep)	40 min.
	2	Horizontal	Front to back		5m/s^2 (0.5 G)			20 min.
	3		Right to left					

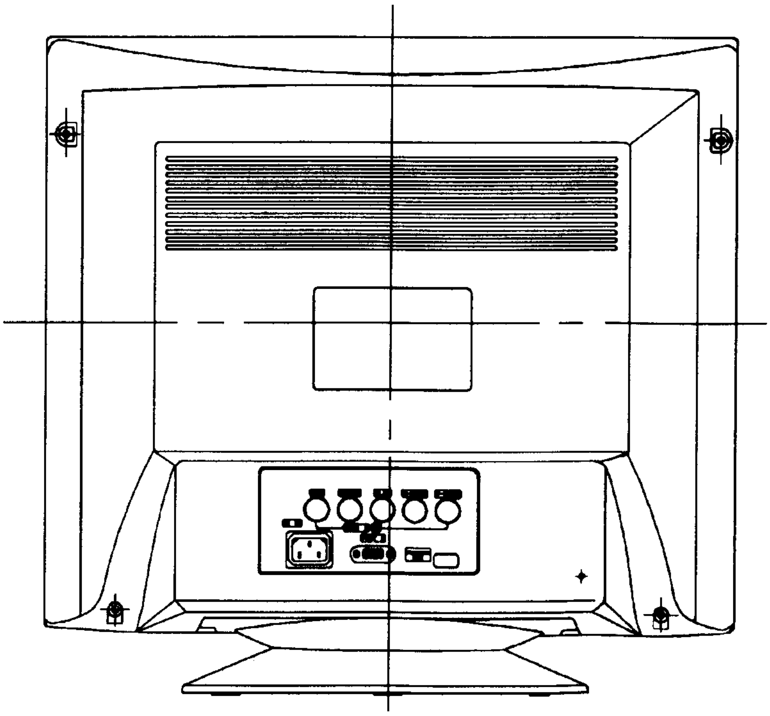
6.2.2 Shock (Drop test)

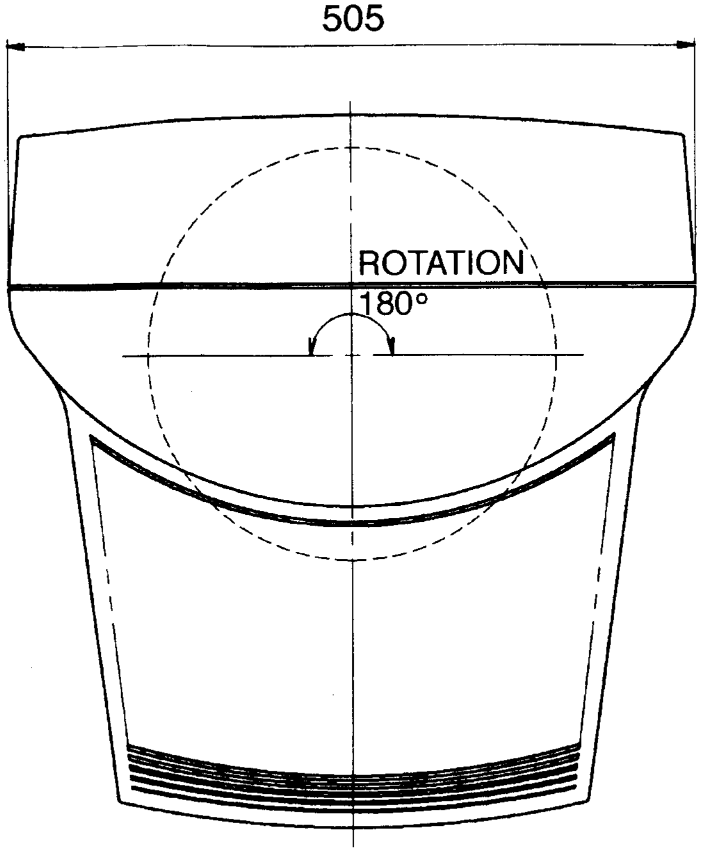
Unpacked	20 G One time for each face (6 faces) (non-operation)			
Packed	Order of drop	Face to drop is to face the floor. (See the figure)	Height	Number of drop
	1	A, B, C, D, E, F, G, H, I	31 cm	1 time for each
	2	J	50 cm	

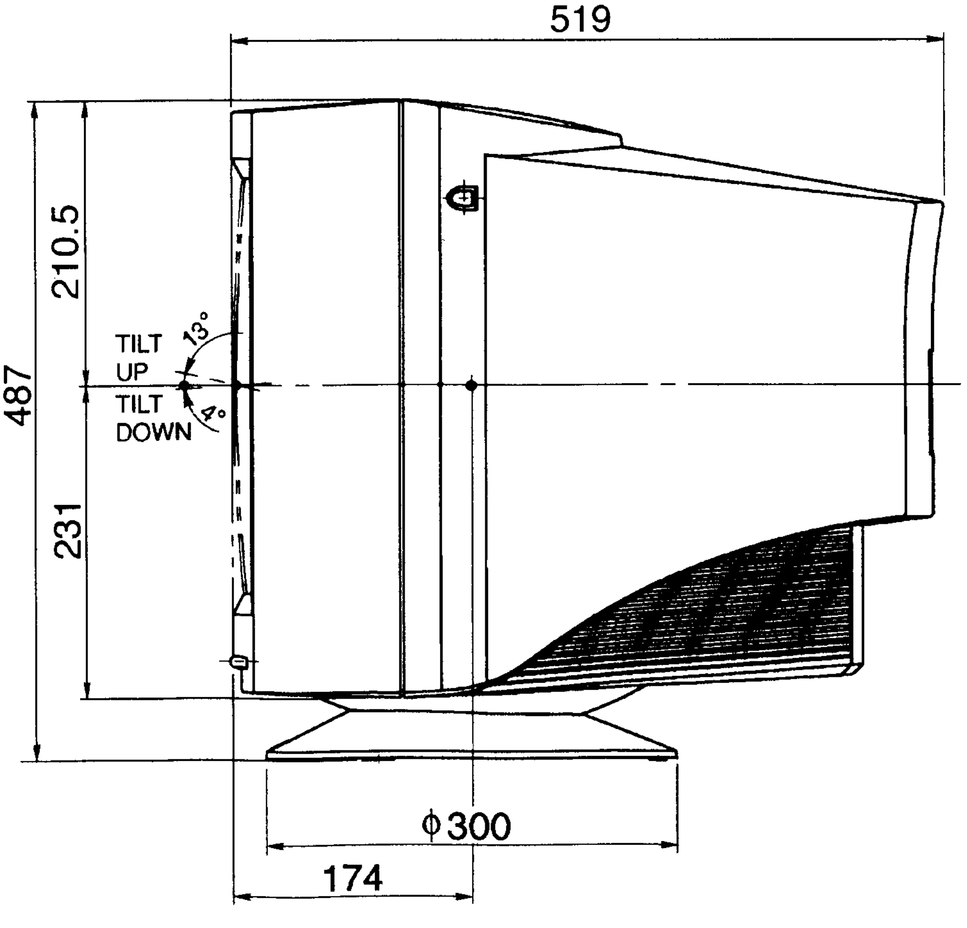

g (top)
h(right)
f (back)
c (edge)
e (front)
a (corner)
d (edge)
i (left)
b (edge)
j (bottom)

DIMENSIONS






505
ROTATION
180°

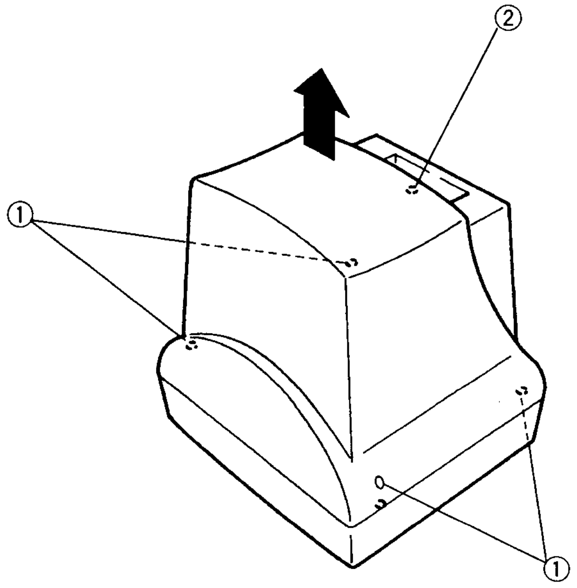

519
210.5
487
TILT
UP
13°
TILT
DOWN
4°
231
ϕ300
174

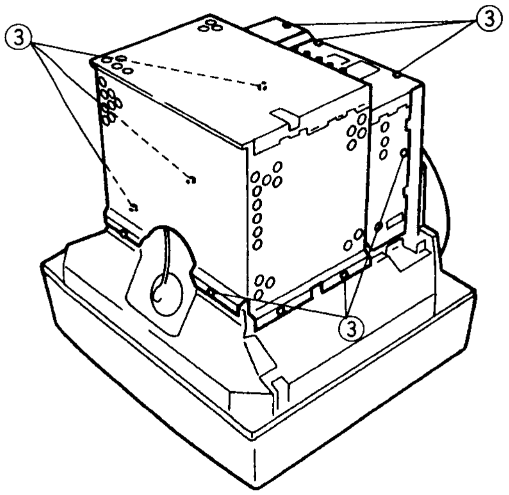
DISASSEMBLY INSTRUCTIONS

1. Rear cover removal

Note: Spread a mat underneath to avoid damaging the CRT surface.

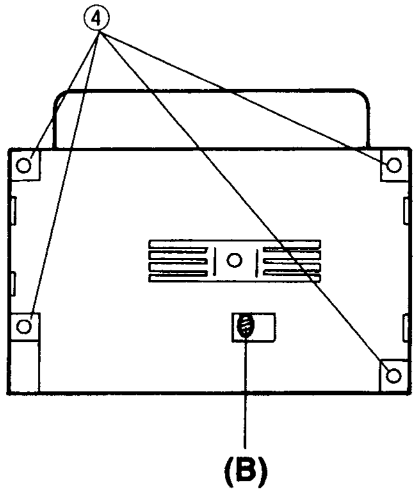
1) Remove four large screws ① and small screw ② from the rear cover.
2) Remove the cover.
3) Remove nine screws ③ from the shield case.
4) Remove the shield case.

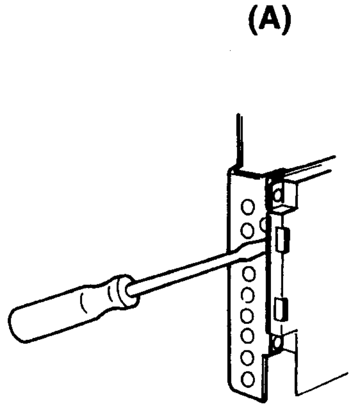




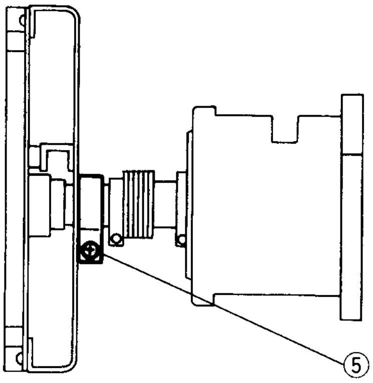
2. Video PCB removal

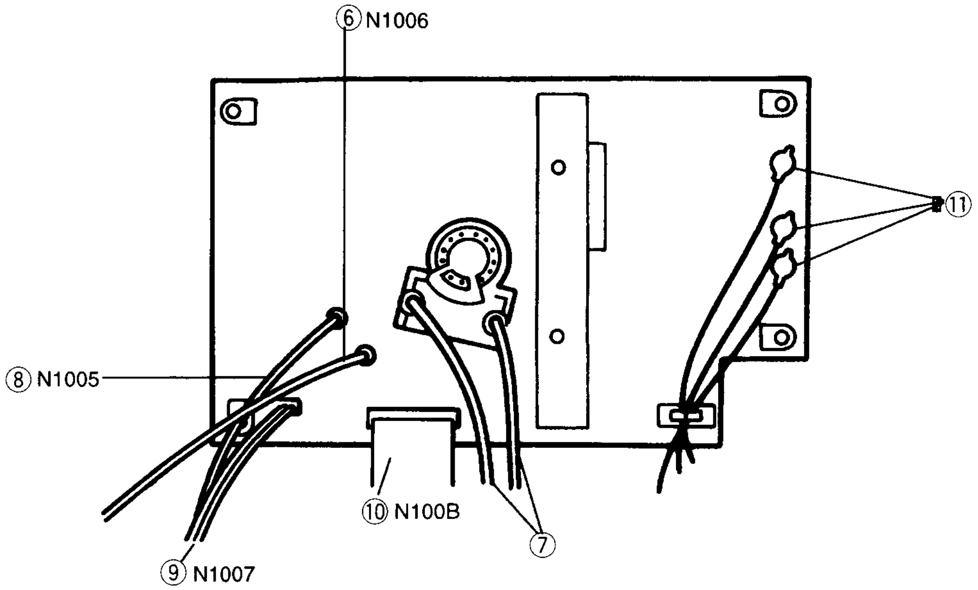
1) Remove four screws ④ securing the shield cover.
2) Desolder (B) and Remove the shield cover (A).

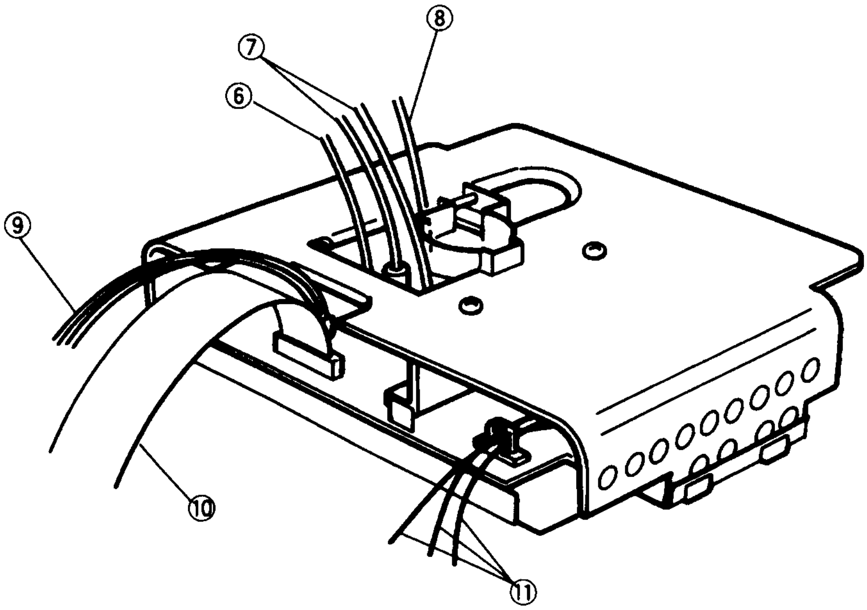




3) Loosen the screw ⑤ securing the CRT neck and the shield case.
4) Remove the PCB block from the CRT.
5) Remove the N1006 connector ⑥.
6) Remove two focus leads ⑦.
7) Remove ground connector ⑧ (N1005) connected to the PCB.
8) Remove N1007 connector ⑨.
9) Remove N100B connector ⑩.
10) Remove RGB connector ⑪.
11) Remove the PCB from the shield case.

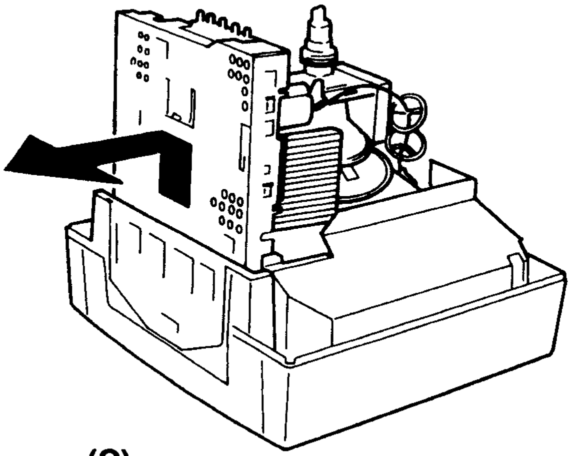



⑥ N1006
⑪
⑧ N1005
⑩ N100B
⑦
⑨ N1007

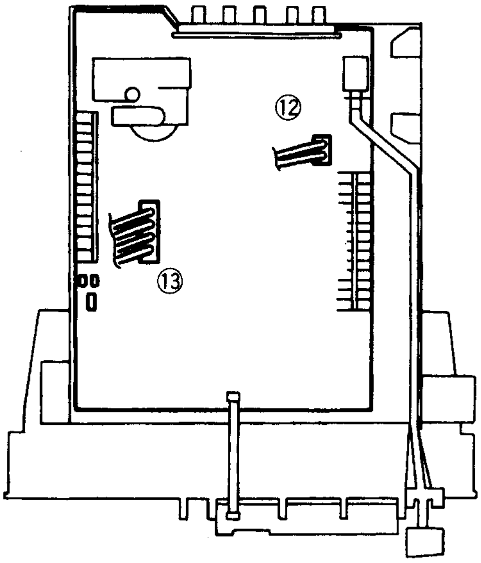


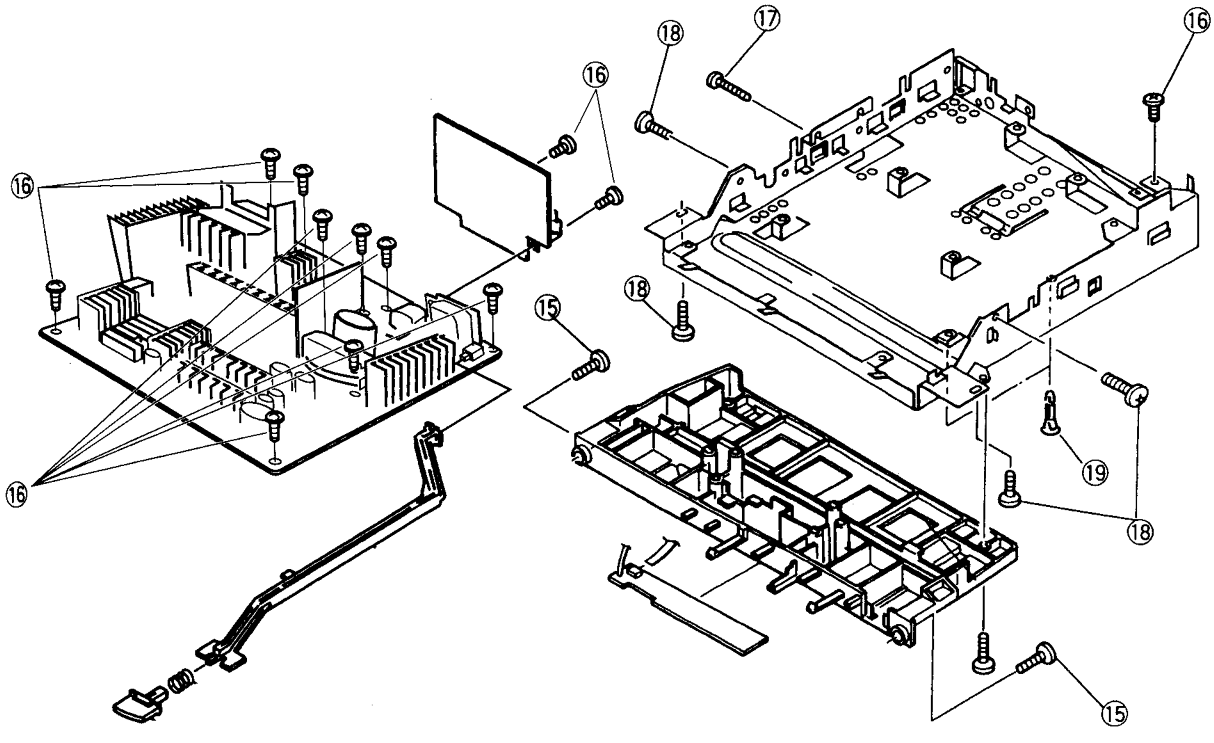
3. Main PCB Removal

1) Remove the connector ⑫ (N901) of the degauss coil.
2) Remove the DY connector ⑬.
3) Remove the anode cap.
4) Move the CRT face down and remove two screws ⑮ securing the bottom fitting metal.
5) Remove the fitting metal and the PCB from the cabinet. (C)
6) Remove thirteen screws ⑯ securing the fitting metal and PCB.
7) Remove screws ⑰ securing the fitting metal and PCB.
8) Remove four screwsthe ⑱ securing the fitting metal and PCB.
9) Remove two clamper ⑲ the fitting metal and PCB.
10) Remove the PCB with the figure referenced.



(C)

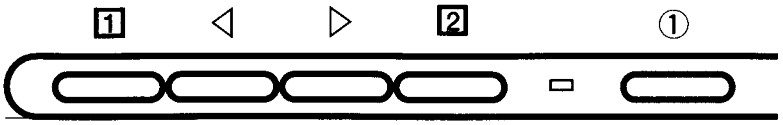




CONTROL LOCATION

[Basic operation]

Control panel



Names of control

- 1 key or Exit key Save key
- Left key
- Right key
- 2 key
- Power Indicator
- Power switch

Functions

- 1 key: To display main menu: quit main menu. *Store change data in the memory.
- Left key / Right key: (1) To display contrast menu; to adjust contrast. (2) To scroll through menu item. (3) To adjust level of selected item.
- 2 key: To select the menu item. To display submenu of selected item.
- Power Indicator: Lights when power switch is pressed· goes out when it is pressed again. Operation / Display of the Power Management Function.
- Power switch: To turn monitor on and off.

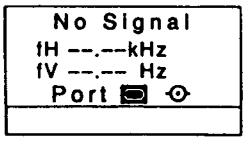
- For a detailed description of the functions of the 1 key, left key, right key, and 2 key.

*Since contrast is the most commonly adjusted parameter, we have provided direct access to this menu item.

Adjustments

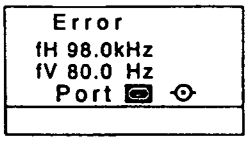
Self-Test menu(No Signal screen

This display indicates that the monitor is operating normally.When one of the following conditions occurs,press one of the 4 operation keys to call the appropriate display.



No Signal
fH --.--kHz
fV --.-- Hz
Port

No signal (The computer is not connected or the mains power to the computer is disconnected)

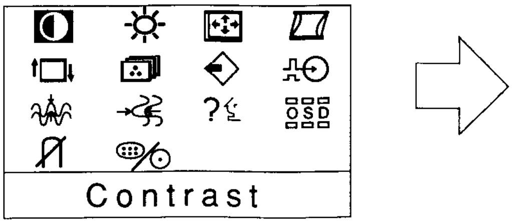


Error
fH 98.0kHz
fV 80.0 Hz
Port

The horizontal sync. signal are outside of the permitted range (the value of the horizontalsync. signal will be displayed in red and the value of the vertical sync. signal will be displayed in white)

Select menu

The adjusted items are represented by icons.
When the key is pressed,the menu screen appears.
Use the or keys to move the cursor to the item to be adjusted,then press the kye to call the adjustment menu.



Contrast

◐	Contrast Adjustment
☼	Brightness Adjustment
⊞	Size & Position adjustment
▭	H.Position
▭	H.Size
▭	V.Position
▭	V.Size
▱	Geometry adjustment
▭	V.pincushion
▭	Side Pin. Bal.
⏢	Trapezoid
▱	Parallelogram
▭	Rotation
▣	Color temp
◈	Recall
⊙	Video input level
≋	H. Moire reduction
≋	V. Moire reduction
?£	Language
	OSD screen position
ℛ	Degauss
⊙	Input select

CAUTION FOR ADJUSTMENT AND REPAIR

1. Degaussing is inevitably required at purity adjustment or convergence adjustment.
2. If you check or adjust electrical specification or function, more than 20 minutes burn-in is required.
3. Reforming of the lead wire is required after your repair work.
4. Prior to starting work, be sure to check that the input signal is at the specified timing and that the polarity is as specified in all modes.
5. Brightness control: After mounting the rear cover, brightness tends to decrease about 5 cd/m^2 on a flat white field and about 1 cm/m^2 on a white raster field. This should be taken into consideration.
6. Brightness stabilizing time: It takes about 20 to 50 seconds for the brightness to stabilize after turning the power off for 5 seconds (AC). Therefore, care should be taken to this.
7. Aging should be made in white raster of 30 ~ 50 cd/m^2 and raster size, 402 x 301 mm before adjusting the ITC.
8. Set the CONTRAST to MAX and BRIGHTNESS to CENTER using the O.S.D.

CAUTION FOR SERVICING

When servicing or replacing the CRT, high voltage sometimes remains on the anode. So, completely discharge high voltage before servicing or replacing the CRT so as to prevent a shock to the service person.

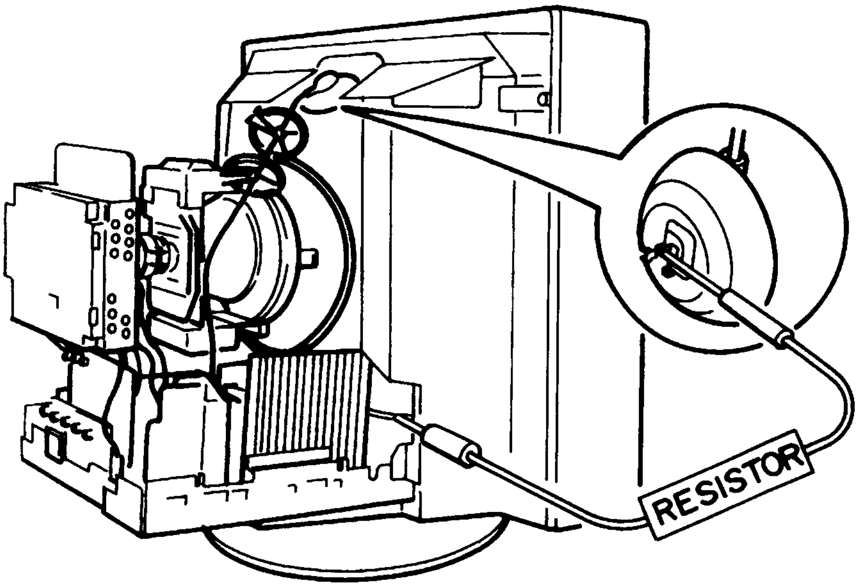
CRT Anode Discharge

1. When you check the CRT anode or replace the CRT, discharge the CRT anode to the external conductive coating (aquadag) of CRT, especially when checked right after power turn-off.
2. Ground one end of a jumper wire which has a resistor (30 kV < resisting pressure 100 MΩ) and connect the other point to the CRT anode.

Note: Grounding must be done first.

This model has a section that does not share a common ground with the power supply section. The different sections are referred to as the HOT section and the COLD section in the precautions below.

1. Do not touch the HOT section and the COLD section at the same time. You may be hit by an electric shock.
2. Do not short the HOT section to the COLD section. This could blow the fuse or damage parts.
3. Never measure the HOT section and the COLD section at the same time when using tools such as oscilloscopes or multimeters.
4. Always unplug the unit before beginning any operation such as removing the chassis.



ADJUSTMENT AND CHECK PROCEDURE

INTRODUCTION

- This monitor is controlled by a microcomputer. With the exception of purity/convergence/focus all is digitally adjusted.

  Therefore a computer, the dedicated control software, the dedicated interface, a 9~12 V power supply, and a signal generator are required servicing.

TOOLS REQUIRED

- **Computer**

  The control software is IBM PC compatible only. Therefore, it is not compatible with any other operating systems. For further information please contact **our sales office.**

- **Control Software**

  The HV10S chassis can only use adjustment program disk" for this model. No other program can access the EEPROM on the monitor. For further information please contact **our sales office.**

- **Interface**

  The interface is dedicated to work only with the control software and the HV chassis. There are no substitutes for this interface. For further information please contact **our sales office.**

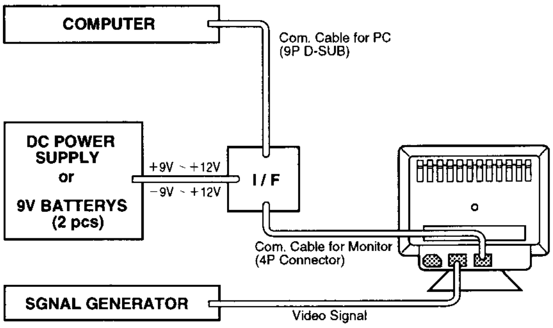
- **Power Supply**

  A DC 9~12 V (+9~12 V/-9~12 V) power supply is required for operating the interface.

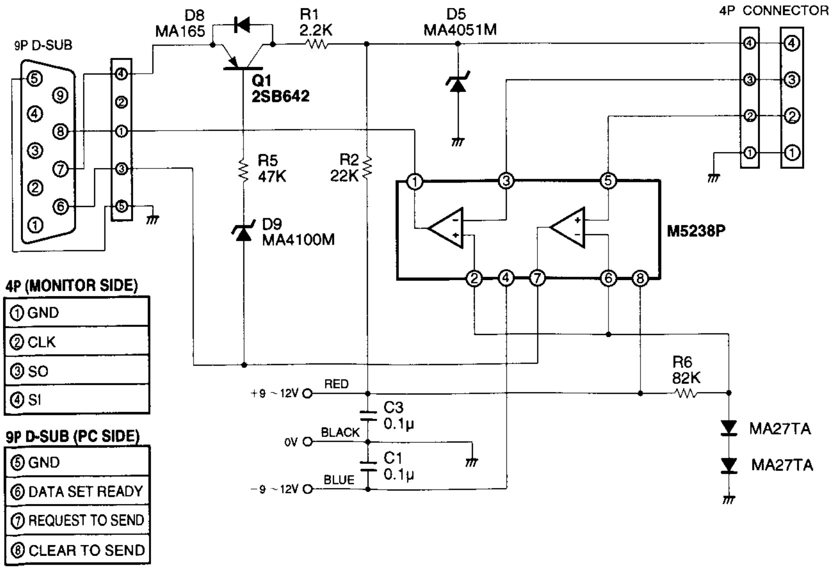
- **Signal Generator**

  It is necessary for you to use a signal generator which operates on fH 95 kHz, fv 180 Hz, and fc 158 MHz bands.

INTERFACE CONNECTION


COMPUTER
Com. Cable for PC (9P D-SUB)
DC POWER SUPPLY or 9V BATTERYS (2 pcs)
+9V ~ +12V
-9V ~ +12V
I / F
Com. Cable for Monitor (4P Connector)
SGNAL GENERATOR
Video Signal

INTERFACE SCHEMATIC DIAGRAM

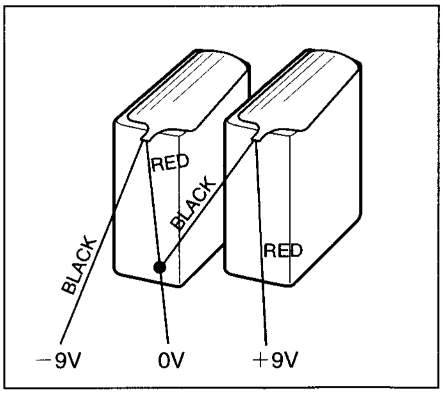

9P D-SUB
D8
MA165
R1
2.2K
D5
MA4051M
4P CONNECTOR
Q1
2SB642
R5
47K
R2
22K
D9
MA4100M
M5238P
R6
82K
+9 ~ 12V
RED
0V
BLACK
-9 ~ 12V
BLUE
C3
0.1µ
C1
0.1µ
MA27TA
MA27TA

4P (MONITOR SIDE)

① GND
② CLK
③ SO
④ SI

9P D-SUB (PC SIDE)

⑤ GND
⑥ DATA SET READY
⑦ REQUEST TO SEND
⑧ CLEAR TO SEND


RED
BLACK
BLACK
RED
-9V
0V
+9V

BATTERY CONNECTION

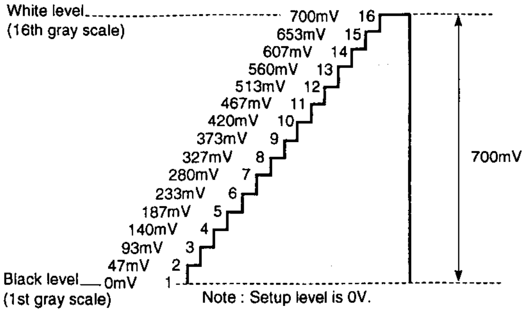
OTHER TOOLS

- Oscilloscope (dual trace)
- Scope probe – Attenuation: 100:1
  Attenuation: 10:1
- Digital Voltmeter – Range: 0 to 1000 V DC
  Accuracy: 0.1 %
- TV color Analyzer II – that reads luminance and chromaticity X and Y coordinates.
- High Voltag Probe
- AC power supply – Output voltage : 0 to 300 V
- Degaussing coil
- Convergence meter
- Scale
- Microscope – Scale factor: 50

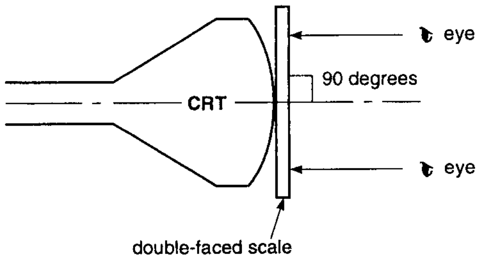
STANDARD CONDITION OF ADJUSTMENT PROCEDURE

• Signal timing :	Preset timing
• Display pattern :	White, full "H" character
• Signal level :	V/H: TTL level video: 700 mV
• Input source :	AC 100~240 V, 50/60 Hz
• Ambient temperature :	Room temperature
• Warm-up time :	More than 30 minutes
• Brightness control :	Center
• Contrast control :	Max.
• Magnetic field :	Vertical: 40 μT Horizontal: 0 μT
• Signal cable :	Attached

Video input signal from PC.



- Use a Helmholtz device to adjust an unit with no horizontal magnetic field and a vertical field of 40 μT. Inspect the unit under the same conditions.
- The ambient illuminance must be 200 lux.
- Use an external degaussing coil any time the DEGAUSS switch does not remove color shading.
- To check the image width, height, linearity and distortion, proceed as below.



ADJUSTMENT SOFTWARE

1. Software operating procedure

A) Power on the computer.

B) Connect the Communication cable for monitor adjustment.

C) Insert the adjustment disk into the drive.

D) At the A:> prompt type "VSR" , then press [ENTER].

> A function to identify the connected monitor is provided to prevent accidents due to erroneous use of the HV10S chassis program. If this program is used for any monitor other than the HV10S, the message reading "This monitor is not an HV10S chassis. All further activity has been prevented" is displayed and the operation is stopped.

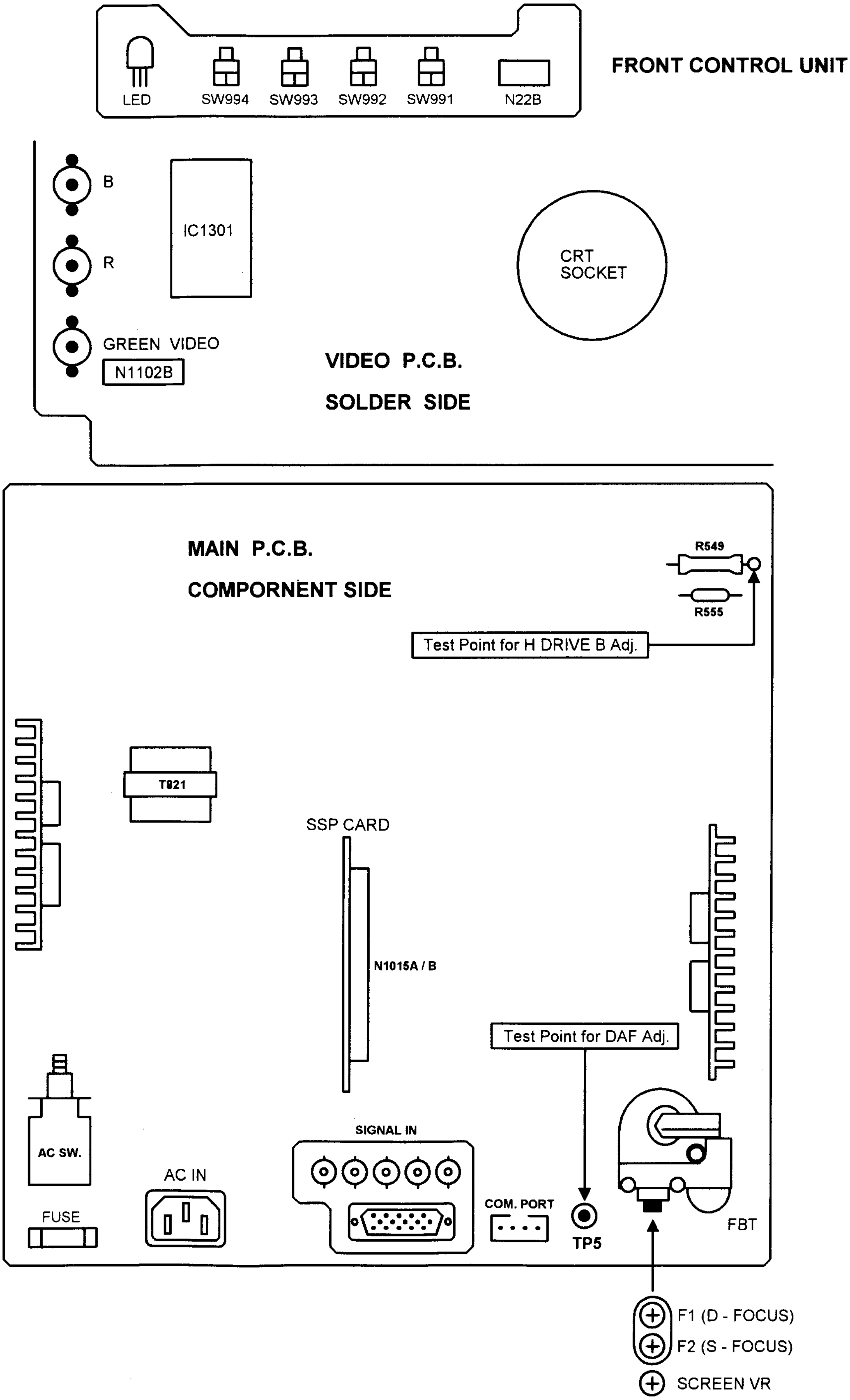
E) Refer to the adjustment procedures.

2. Adjustment Program

Main Menu of Adjustment Program

```
       <<HV10S ADJUSTMENT PROGRAM MENU>>
                           (e: exit, q: quit)  <Ver *.*>
 1) Load data from FILE     6) Save data to FILE
 2) Adjust VSR setting      7) Special ADJUST
 3) Adjust STD setting      8) Information Service
 4) Adjust Factory preset   9) Show Version & Error
 5) Clear User preset      10) DDC EDID Date seeting
```

SERVICE ADJUSTMENT CONTROL LOCATION


FRONT CONTROL UNIT
LED
SW994
SW993
SW992
SW991
N22B
B
R
GREEN VIDEO
N1102B
IC1301
CRT SOCKET
VIDEO P.C.B.
SOLDER SIDE
MAIN P.C.B.
COMPORNENT SIDE
R549
R555
Test Point for H DRIVE B Adj.
T821
SSP CARD
N1015A / B
Test Point for DAF Adj.
AC SW.
FUSE
AC IN
SIGNAL IN
COM. PORT
TP5
FBT
F1 (D - FOCUS)
F2 (S - FOCUS)
SCREEN VR

REQUIRED ADJUSTMENT PROCEDURE AFTER A PARTS IS REPLACED (✓ IS REQUIRED)

ADJUSTMENT ITEM		REPLACED PARTS																
		MAIN P.C.B.	SSP CARD	VIDEO P.C.B.	CRT DY	IC1301 IC1302 IC1303 IC1305 IC1331	Q1065 Q1165 Q1265	IC490	IC580	Q550 IC850 Q881	FBT IC671 Q601							
A	DATA SETTING *	✓	✓															
B	H. DRIVE +B ADJUST	✓	✓						✓									
C	EHT ADJUST	✓	✓		✓						✓							
D	H CENTER ADJUST	✓	✓		✓					✓								
E	SUB ADJUST	✓	✓		✓			✓		✓	✓							
F	VSR SETTING	✓	✓		✓			✓		✓	✓							
G	PRESET ADJUST	✓	✓		✓			✓		✓	✓							
H	BRIGHTNESS, COLOR	✓	✓	✓	✓	✓	✓				✓							
I	DAF ADJUST	✓	✓		✓						✓							
J	FOCUS ADJUST	✓	✓		✓						✓							
K	DATA SAVING	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓							
L	DDC DATA SETTING	✓	✓															
	PURITY & CONVERGENCE				✓													
	SCREEN CHECK	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓							

*** (A) DATA SETTING : Do not load standard data except when main PCB and SSP Card are replaced.**

ADJUSTMENT PROCEDURE

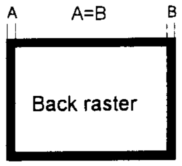
Note 1 : Check to be sure that the program disk name is **S110** before making necessary adjustment.

Note 2 : Unless otherwise specified, the monitor state is as given at right.

Note 3 : The underlined places indicate the adjustment items on the screen of the PC.

1. Description of Adjustment Method

	ITEM Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
A	**STANDARD DATA SETTING** 1) Load data from FILE		A1		Turn on the power switch of the monitor.	
			A2		Set the cell to the menu at left and press [↵].	
			A3		A massage **FILE -> EEPROM FILE NAME (q or Q escape) [ ] :** is displayed. So key in the DACDATA.DAT (when using the standard data) and press [↵].	
			AE		Turn off the power switch of the monitor, then turn on again.	
	Do not load standard data except when Main P.C.B. and SSP Card are replaced.					
B	**H. DRIVE +B** 2) Adjust VSR setting	◇ Digital Voltmeter ▼ R549 ~ GND Refer to Service Adjustment Control Location for this connect point. ☐ Crosshatch	B1		Set the cell to the menu at left and press [↵].	
			B2		Set the cell to the adjusting mode INTP [0] and press [↵].	
			B3	HV10S-1	Check that the input signal to the monitor is [fH 29.1KHz] and [fV 47.5Hz] and press [↵].	
			B4		Set the cell to H. DRIVE +B and press [↵].	
			B5		Make the adjustment to the value shown at right by using [←] and [→].	25.3V ±0.5V
			B6		Register by press [↵] and return to menu of **B2** by press [**E**].	
			B7	HV10S-2	Input signal [fH 52.2kHz] and [fV 92.3Hz]	
			B8		Select Adjusting mode INTP [1], and repeat above (**B4 B5 B6**) procedure.	23.4V ±0.5V
			B9	HV10S-3	Input signal [fH 75.2kHz] and [fV 137.2Hz]	
			B10		Select Adjusting mode INTP [2], and repeat above (**B4 B5 B6**) procedure.	21.4V ±0.5V
			B11	HV10S-4	Input signal [fH 96.5kHz] and [fV 182.1Hz]	
			B12		Select Adjusting mode INTP [3], and repeat above (**B4 B5 B6**) procedure.	19.2V ±0.5V
			BE		Press [**E**] to return to main menu.	

	ITEM Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
C	**EHT ADJUST** 3) Adjust OTHER setting	◇ Digital Voltmeter	C1		Turn the power switch of the monitor OFF.	
		◇ High Voltage Probe	C2		Connect high voltage probe to Anode Cap and GND.	
			C3		Turn the power switch of the monitor ON.	
		▼ Anode Cap ~ GND	C4		Set the cell to the menu at left and press [↵].	
	Adjust NON-VSR Setting	☐ RGB off (Sync only)	C5		Set the cell to Adjust NON-VSR Setting and press [↵].	
			C6	HV10S-4	Check that the input signal to the monitor is [fH 96.5kHz] and [fV 182.1Hz] and press [↵].	
			C7		Move the cell to EHT and press [↵].	
			C8		Make adjustment to the value shown at right by using [←] and [→].	27kV ±0.3kV
			CE		Register by pressing [↵] and return to menu of **C5**, then return to the main menu by pressing [**E**].	
D	**H. CENTER** 2) Adjust VSR setting	☐ RGB off (Sync only)	D1		Set the Brightness to MAX by using OSD.	
			D2		Set the cell to the menu at left and press [↵].	
			D3		Set the cell to the adjusting mode INTP [0] and press [↵].	
			D4	HV10S-1	Check that the input signal to the monitor is [fH 29.1kHz] and [fV 47.5Hz] and press [↵].	Set the raster to the center with respect to the bezel.
			D5		Set the cell to H CENTER and press [↵].	
			D6		Make the adjustment to the value shown at right by using [←] and [→].	
			D7		Press [↵] to register, and return to menu of **D3**.	
			D8	HV10S-2	Input signal [fH 52.2kHz] and [fV 92.3Hz]	
			D9		Select Adjusting mode INTP [1], and repeat above (**D5 D6 D7**) procedure.	
			D10	HV10S-3	Input signal [fH 75.2kHz] and [fV 137.2Hz]	
			D11		Select Adjusting mode INTP [2], and repeat above (**D5 D6 D7**) procedure.	
			D12	HV10S-4	Input signal [fH 96.5kHz] and [fV 182.1Hz]	
			D13		Select Adjusting mode INTP [3], and repeat above (**D5 D6 D7**) procedure.	
			DE		Return to the main menu by pressing [**E**].	

	ITEM Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
E	**SUB ADJUST** 3) Adjust OTHER setting	☐ Crosshatch	E1		Set the cell to the menu at left and press [↵], then go to sub menu.	
			E2		Set the cell to Adjust NON-VSR Setting at the sub menu and press [↵].	
	Adjust NON-VSR Setting		E3	Mode-1	Check that the input signal to the monitor is [fH 93.8KHz] and [fV 75.0Hz] and press [↵].	
			E4		Set the cell to following items, press [↵] and make the adjustment to the value shown at right by using [←] and [→].	②③④⑤⑥⑦⑧: Best point
	H Size, H Position, V Size and V PCC adjustment do not register to interpolation data.				* H. SIZE * H POSITION * V SIZE * V PCC ① V POSITION ⑤ V PCC CORNER ② V LIN (S) ⑥ TRAPEZOID ③ V LIN (C) ⑦ PARALLELOGRAM ④ V PCC (S) ⑧ V PCC BALANCE	① / H Posi : Center H : 392mm V : 294mm
			EE		After adjustment, return to menu of **E2** by pressing [**E**], then return to the main menu by pressing [**E**].	
F	**VSR SETTING** 2) Adjust VSR Setting	☐ Crosshatch	F1		Set the cell to the menu at left and press [↵].	
			F2		Set the cell to the adjusting mode INTP [0] and press [↵].	
			F3	HV10S-1	Check that the input signal to the monitor is [fH 29.1kHz] and [fV 47.5Hz] and press [↵].	
			F4		Set the cell to following items, press [↵] and make the adjustment to the value shown at right by using [←] and [→].	① : 392mm ±5 ③ : 294mm ±5
	V Position adjustment do not register to interpolation data.				* V POSITION ① H. SIZE ③ V SIZE ② H POSITION ④ V PCC GAIN	② / V Posi : Center ④ : Best point
			F5		Press [↵] to register, and return to menu of **F2**.	
			F6	HV10S-2	Input signal [fH 52.2kHz] and [fV 92.3Hz]	
			F7		Select Adjusting mode INTP [1], and repeat above (**F4 F5**) procedure.	
			F8	HV10S-3	Input signal [fH 75.2kHz] and [fV 137.2Hz]	
			F9		Select Adjusting mode INTP [2], and repeat above (**F4 F5**) procedure.	
			F10	HV10S-4	Input signal [fH 96.5kHz] and [fV 182.1Hz]	
			F11		Select Adjusting mode INTP [3], and repeat above (**F4 F5**) procedure.	
			FE		Return to the main menu by pressing [**E**].	

	ITEM Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
G	**PRESET ADJUST** 4) Adjust Factory preset	☐ Crosshatch	G1	Mode-1	Set the cell to the menu at left and press [↵].	
			G2		Check that the input signal to the monitor is [fH 93.8KHz] and [fV 75.0Hz] and press [↵].	
			G3		Set the cell to following items, press [↵] and make the adjustment to the value shown at right by using [←] and [→]. ① H. SIZE ② H. POSI ③ V. SIZE ④ V. POSI ⑤ V. PCC ⑥ V. PCC BALANCE ⑦ TRAPEZOID ⑧ PARALLEL	① : 392mm ±5 ③ : 294mm ±5 ②④ : Center ⑤⑥⑦⑧ : Best point
			G4	Mode-2	After adjustment, return to main menu by pressing [**E**] and [**Y**].	① : 392mm ±7 ③ : 294mm ±7 ②④ : Center ⑤⑥⑦⑧ : Best point
			G5		Check that the input signal to the monitor is [fH 31.5KHz] and [fV 60.0Hz] and press [↵].	
			G6		Make adjustment ①~⑧ of **G3** to the value shown at right by using [←] and [→].	
			G7	Mode-3	After adjustment, return to the menu of **G2** by pressing [**E**] and [**Y**].	① : 392mm ±7 ③ : 294mm ±7 ②④ : Center ⑤⑥⑦⑧ : Best point
			G8		Check that the input signal to the monitor is [fH 46.9KHz] and [fV 75.0Hz] and press [↵].	
			G9		Make adjustment ①~⑧ of **G3** to the value shown at right by using [←] and [→].	
			G10	Mode-4	After adjustment, return to the menu of **G2** by pressing [**E**] and [**Y**].	① : 392mm ±7 ③ : 294mm ±7 ②④ : Center ⑤⑥⑦⑧ : Best point
			G11		Check that the input signal to the monitor is [fH 60.0KHz] and [fV 75.0Hz] and press [↵].	
			G12		Make adjustment ①~⑧ of **G3** to the value shown at right by using [←] and [→].	
			G13	Mode-5	After adjustment, return to the menu of **G2** by pressing [**E**] and [**Y**].	① : 392mm ±7 ③ : 294mm ±7 ②④ : Center ⑤⑥⑦⑧ : Best point
			G14		Check that the input signal to the monitor is [fH 68.7KHz] and [fV 75.0Hz] and press [↵].	
			G15		Make adjustment ①~⑧ of **G3** to the value shown at right by using [←] and [→].	
			G16	Mode-6	After adjustment, return to the menu of **G2** by pressing [**E**] and [**Y**].	① : 368mm ±7 ③ : 294mm ±7 ②④ : Center ⑤⑥⑦⑧ : Best point
			G17		Check that the input signal to the monitor is [fH 64.0KHz] and [fV 60.0Hz] and press [↵].	
			G18		Make adjustment ①~⑧ of **G3** to the value shown at right by using [←] and [→]. After adjustment, return to the menu of **G2** by pressing [**E**] and [**Y**].	
					- To be continued -	

	ITEM Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
G	**PRESET ADJUST** 4) Adjust Factory preset	☐ Crosshatch	G19	Mode-7	Check that the input signal to the monitor is [fH 80.0KHz] and [fV 75.0Hz] and press [↵].	① : 368mm ±7 ③ : 294mm ±7
			G20		Make adjustment ①~⑧ of **G3** to the value shown at right by using [←] and [→].	②④ : Center ⑤⑥⑦⑧ : Best point
			G21		After adjustment, return to the menu of **G2** by pressing [**E**] and [**Y**].	
			G22	Mode-8	Check that the input signal to the monitor is [fH 87.5KHz] and [fV 70.0Hz] and press [↵].	① : 392mm ±7 ③ : 294mm ±7
			G23		Make adjustment ①~⑧ of **G3** to the value shown at right by using [←] and [→].	②④ : Center ⑤⑥⑦⑧ : Best point
			GE		After adjustment, return to the menu of **G2** by pressing [**E**] and [**N**], then return to the main menu by pressing [**E**].	
H	**CRT CUT-OFF ADJUST**	◇ TV Color Analyzer II	H1	Mode-1	Set the Contrast to MAX, Brightness to Center and Color is "9300k +8" using the OSD.	
		☐ RGB Off (Sync only)	H2		Check that the input signal to the monitor is [fH 93.8KHz], [fV 75.0Hz] and turn off the RGB signal.	
	3) Adjust OTHER setting		H3		Set the cell to the menu at left and press [↵] .	
	Adjust VIDEO Setting		H4		Set the cell to Adjust VIDEO Setting at the sub menu and press [↵].	
			H5 ~ H14		Make the adjustment R,G and B Low Light by using [←] [→] and Screen VR to CRT cut-off. **Please refer to flow chart for this adjustment on page 30.**	
	BRIGHTNESS / COLOR ADJUST	☐ White window (8cm×8cm at center)	H15		Change to the pattern at left.	
			H16		Move the cell to the following items and make the adjustment to the value shown at right by using [←] and [→]. R. SUB CONT (COLOR0) G. SUB CONT (COLOR0) B. SUB CONT (COLOR0)	Y=105 cd/m^2 x=0.283 ±0.20 y=0.298 ±0.20
			H17		Set Contrast to MIN using the OSD.	
			H18		Move the cell to the following items and make the adjustment to the value shown at right by using [←] and [→]. R. LOW LIGHT G. LOW LIGHT B. LOW LIGHT **Adjust two colors only out of above three as shown in H13 on page 30.**	x=0.283 ±0.20 y=0.298 ±0.20
			H19		Set Contrast to MAX using the OSD.	Y=105 cd/m^2
			H20		Check the value shown at right, then If out of range, to repeat **H15~H18**.	x=0.283 ±0.20 y=0.298 ±0.20
					- To be continued -	

ITEM Program Menu		◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
H	**ABL**	☐ White flat field	H21	Mode-1	Change to the pattern at left.	
		(full window)	H22		Move the cell to ABL (COLOR0) and make the adjustment to the value shown at right by using [←] and [→].	Y=95 cd/m^2
			H23		Press [**E**] to messages will appear. **Start automatic calculation. OK (y/n) ->**	
			H24		Press[**Y**]and [↵]. **Refresh LOW-LIGHT2 data (y/n) ->**	
			H25		Press[**Y**]and [↵], then return to menu of **H4**.	
			H26		Return to the main menu by pressing [**E**].	
	1.0V ADJUST	☐ White window	H27		Change to the pattern at left.	
	7) Special ADJUST	(8cm×8cm at	H28		Change signal to 1.0V p-p Video.	
	1: Adjust VIDEO	center)	H29		Set the cell to the menu at left and press [↵].	
	1.0Vpp		H30		Select the 1: Adjust VIDEO 1.0Vpp from the menu.	
			H31		Make the adjustment to the value shown at right by using [←] and [→].	Y=105 cd/m^2
			HE		Press [↵] to return to menu of **H30**, then return to the main menu by pressing [**E**]	
I	**DAF ADJUST**	☐ White flat field	I 1		Set the cell to the menu at left and press [↵].	
	2) Adjust VSR setting	◇ Oscilloscope	I 2		Set the cell to the menu at left and press [↵].	
		▼ TP5~GND 100:1 probe	I 3		Set the cell to the adjusting mode INTP [0] and press [↵].	
		▼ N1102B ~ GND	I 4	HV10S-1	Check that the input signal to the monitor is [fH 29.1kHz] and [fV 47.5Hz].	
		10:1 probe	I 5		Set the cell to H DAF PHASE and press [↵].	
			I 6		Adjust as shown at below by using [←] and [→], and press [↵] for registration. (Refer to **Fig. I6** for adjustment on next page)	
			I 7		Set the cell to H DAF GAIN and press [↵].	
			I 8		Adjust as shown at right by using [←] and [→], and press [↵] for registration. (Refer to **Fig. I8** for adjustment on next page)	C - D = 468V
			I 9		Press [↵] to register, and return to menu of **I3**.	
			I 10	HV10S-2	Input signal [fH 52.2kHz] and [fV 92.3Hz]	
			I 11		Select Adjusting mode INTP [1], and repeat above (**I5 I6 I7 I8 I9**) procedure.	
			I 12	HV10S-3	Input signal [fH 75.2kHz] and [fV 137.2Hz]	
			I 13		Select Adjusting mode INTP [2], and repeat above (**I5 I6 I7 I8 I9**) procedure.	
			I 14	HV10S-4	Input signal [fH 96.5kHz] and [fV 182.1Hz]	
			I 15		Select Adjusting mode INTP [3], and repeat above (**I5 I6 I7 I8 I9**) procedure.	
			I E		Return to the main menu by pressing [**E**].	

Fig. I4

Set position to A=B

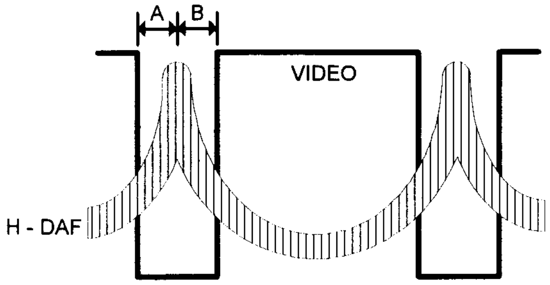
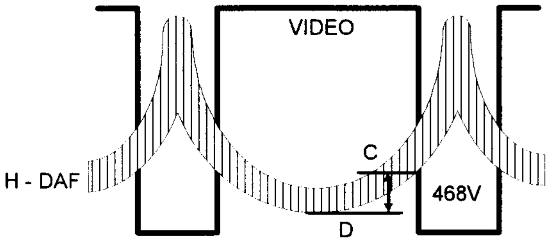


Fig. I8

Set voltage to C - D = 468V

C : Clossing VIDEO and H. DAF
D : Bottom of H. DAF



Oscilloscope Range

HV10S - 1	10 µs / div.
HV10S - 2	5 µs / div.
HV10S - 3	5 µs / div.
HV10S - 4	2 µs / div.

	ITEM Program Menu	◇ Test Meter ▼ Test Point ☐ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
J	**FOCUS**	☐ Character	J1	MODE-1	Check that the input signal to the monitor is [fH 93.8KHz] and [fV 75.0Hz].	
			J2		Make the corner sections of the screen optimum by turning D-FOCUS VR on the FBT.	
			J3		Make the center section optimum by turning S-FOCUS VR on the FBT.	
			J4		Repeat **J2** and **J3** to make it optimum.	
K	**DATA SAVING** 6) Save data to file		K1		Set the cell to the menu at left and press [↵].	
			K2		Key in the file name after [ ] :. Use serial number as a file name (EXAMPLE : FF7410001 = “FF7410.001”)	

	ITEM Program Menu	◇ Test Meter ▼ Test Point □ Pattern	JOB CODE	Input Signal	Operation	Adjusting Value
L	**DDC DATA SET** 7) Special ADJUST 7: Change DDC data		L1		Set the cell to the menu at left and press [↵].	
			L2		Select the 7: Change DDC data from the menu.	
			L3		Key in the monitor serial number and press [↵]. < ID Serial Number : > (4 digits)	
			L4		Key in the product Week and press [↵]. < Week of Manufacture : > (2 digits)	
			L5		Key in the product Year and press [↵]. < Year of Manufacture : > (4 digits)	
			LE		Press [**E**] to return to main menu.	
					To get data of **L3** (U/N), **L4** (week) and **L5** (year) by reading **Fig. L** from the Serial Number.	

Fig. L

F	×	7	4	1	0	0	0	1
①		②	③		④			

① Factory Code
② Year Code
③ Month & Date Code
④ Unit Number

Example

S/N : FA7410001
Year ------------------- 1997
Week ------------------ 27
Unit Number -------- 0001

Data table for **Year** and **Week** from the **Serial Number**

②③	Year	Week	②③	Year	Week	②③	Year	Week	②③	Year	Week
741	**1997**	**27**	811	**1998**	**02**	841	**1998**	**27**	911	**1999**	**02**
742	**1997**	**28**	812	**1998**	**03**	842	**1998**	**29**	912	**1999**	**03**
743	**1997**	**30**	813	**1998**	**04**	843	**1998**	**30**	913	**1999**	**04**
744	**1997**	**31**	814	**1998**	**06**	844	**1998**	**32**	914	**1999**	**06**
745	**1997**	**33**	815	**1998**	**07**	845	**1998**	**33**	915	**1999**	**07**
746	**1997**	**34**	816	**1998**	**09**	846	**1998**	**34**	916	**1999**	**09**
751	**1997**	**36**	821	**1998**	**10**	851	**1998**	**36**	921	**1999**	**10**
752	**1997**	**37**	822	**1998**	**11**	852	**1998**	**37**	922	**1999**	**11**
753	**1997**	**39**	823	**1998**	**13**	853	**1998**	**39**	923	**1999**	**13**
754	**1997**	**40**	824	**1998**	**14**	854	**1998**	**40**	924	**1999**	**14**
755	**1997**	**42**	825	**1998**	**16**	855	**1998**	**42**	925	**1999**	**16**
756	**1997**	**43**	826	**1998**	**17**	856	**1998**	**43**	926	**1999**	**17**
761	**1997**	**45**	831	**1998**	**18**	861	**1998**	**45**	931	**1999**	**19**
762	**1997**	**46**	832	**1998**	**20**	862	**1998**	**46**	932	**1999**	**20**
763	**1997**	**47**	833	**1998**	**21**	863	**1998**	**48**	933	**1999**	**21**
764	**1997**	**49**	834	**1998**	**23**	864	**1998**	**49**	934	**1999**	**23**
765	**1997**	**50**	835	**1998**	**24**	865	**1998**	**50**	935	**1999**	**24**
766	**1997**	**52**	836	**1998**	**26**	866	**1998**	**52**	936	**1999**	**26**

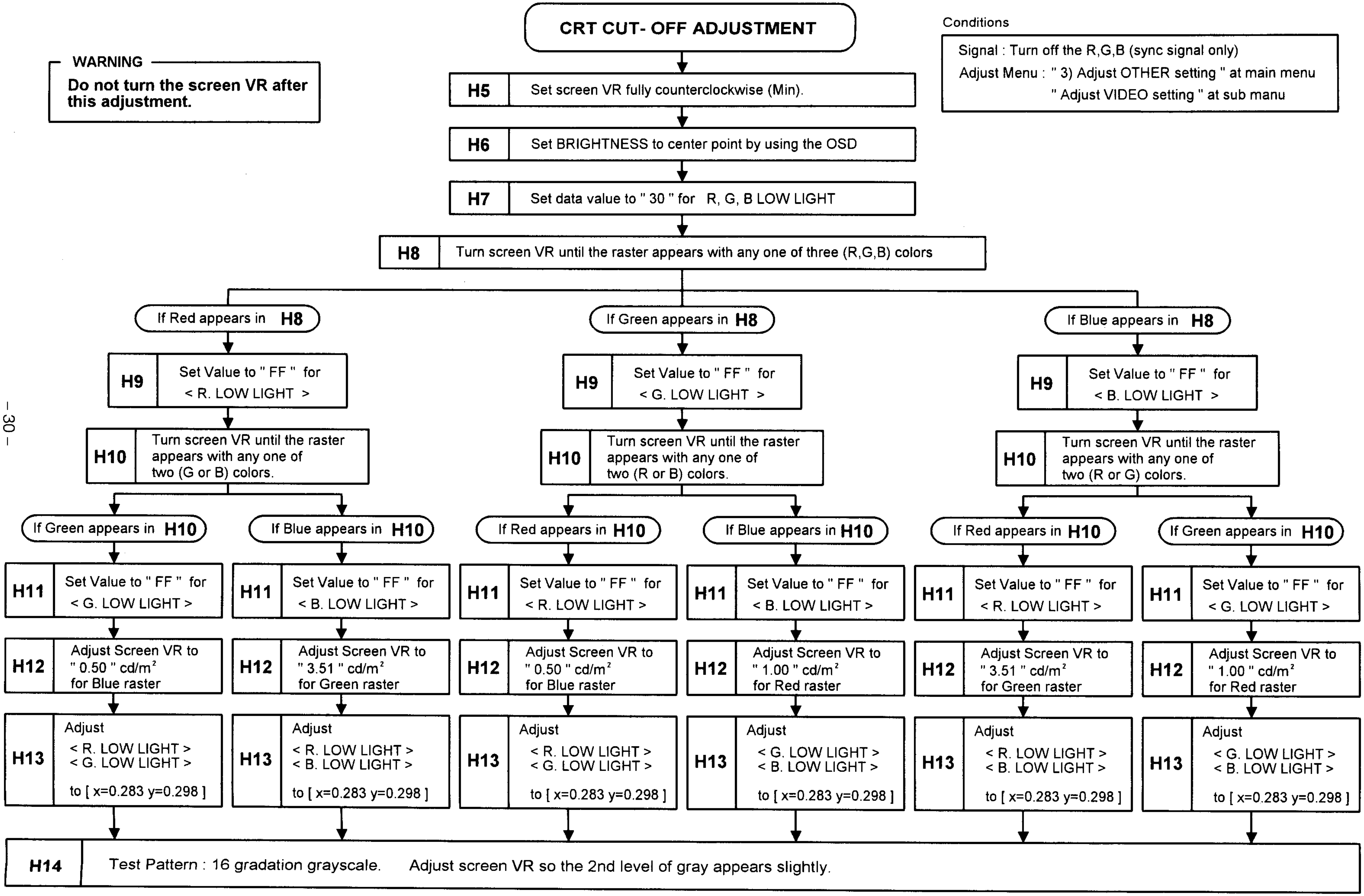
WARNING

Do not turn the screen VR after this adjustment.

Conditions

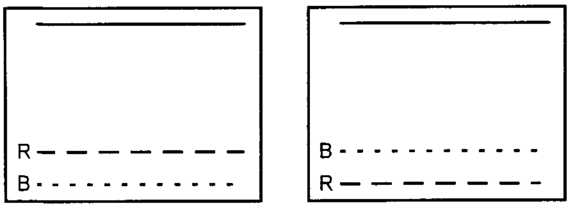
Signal : Turn off the R,G,B (sync signal only)
Adjust Menu : " 3) Adjust OTHER setting " at main menu
" Adjust VIDEO setting " at sub manu

CRT CUT- OFF ADJUSTMENT

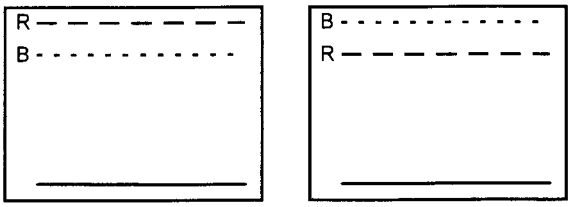

CRT CUT- OFF ADJUSTMENT
H5 Set screen VR fully counterclockwise (Min).
H6 Set BRIGHTNESS to center point by using the OSD
H7 Set data value to " 30 " for R, G, B LOW LIGHT
H8 Turn screen VR until the raster appears with any one of three (R,G,B) colors
If Red appears in H8
H9 Set Value to " FF " for < R. LOW LIGHT >
H10 Turn screen VR until the raster appears with any one of two (G or B) colors.
If Green appears in H10
H11 Set Value to " FF " for < G. LOW LIGHT >
H12 Adjust Screen VR to " 0.50 " cd/m² for Blue raster
H13 Adjust < R. LOW LIGHT > < G. LOW LIGHT > to [x=0.283 y=0.298]
If Blue appears in H10
H11 Set Value to " FF " for < B. LOW LIGHT >
H12 Adjust Screen VR to " 3.51 " cd/m² for Green raster
H13 Adjust < R. LOW LIGHT > < B. LOW LIGHT > to [x=0.283 y=0.298]
If Green appears in H8
H9 Set Value to " FF " for < G. LOW LIGHT >
H10 Turn screen VR until the raster appears with any one of two (R or B) colors.
If Red appears in H10
H11 Set Value to " FF " for < R. LOW LIGHT >
H12 Adjust Screen VR to " 0.50 " cd/m² for Blue raster
H13 Adjust < R. LOW LIGHT > < G. LOW LIGHT > to [x=0.283 y=0.298]
If Blue appears in H10
H11 Set Value to " FF " for < B. LOW LIGHT >
H12 Adjust Screen VR to " 1.00 " cd/m² for Red raster
H13 Adjust < G. LOW LIGHT > < B. LOW LIGHT > to [x=0.283 y=0.298]
If Blue appears in H8
H9 Set Value to " FF " for < B. LOW LIGHT >
H10 Turn screen VR until the raster appears with any one of two (R or G) colors.
If Red appears in H10
H11 Set Value to " FF " for < R. LOW LIGHT >
H12 Adjust Screen VR to " 3.51 " cd/m² for Green raster
H13 Adjust < R. LOW LIGHT > < B. LOW LIGHT > to [x=0.283 y=0.298]
If Green appears in H10
H11 Set Value to " FF " for < G. LOW LIGHT >
H12 Adjust Screen VR to " 1.00 " cd/m² for Red raster
H13 Adjust < G. LOW LIGHT > < B. LOW LIGHT > to [x=0.283 y=0.298]
H14 Test Pattern : 16 gradation grayscale. Adjust screen VR so the 2nd level of gray appears slightly.

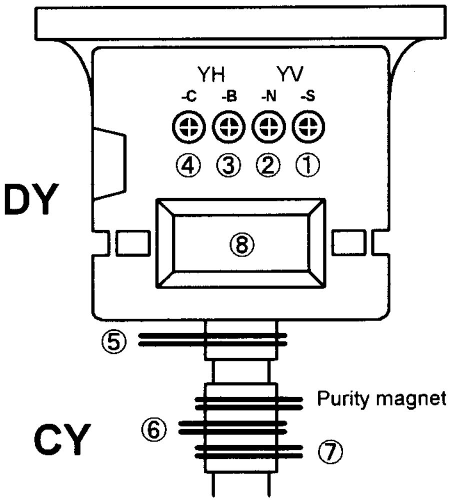
2. Adjustment Location for Purity and Convergence

① Differential VR YV-S

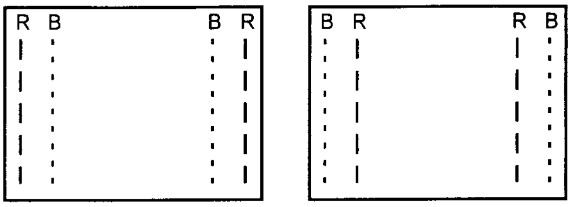


② Differential VR YV-N

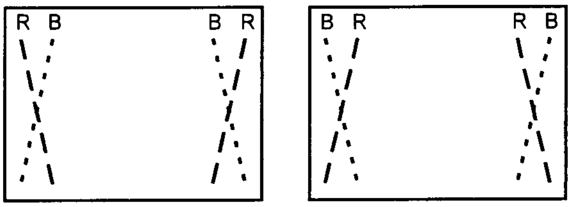



YH
YV
-C
-B
-N
-S
④
③
②
①
DY
⑧
⑤
Purity magnet
CY
⑥
⑦

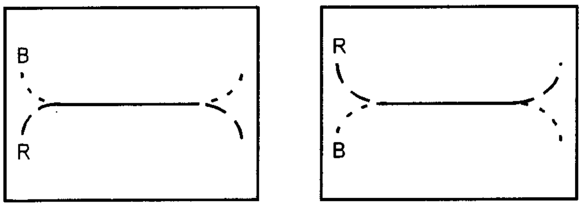
③ Differential VR YH-B



④ Differential VR YH-C



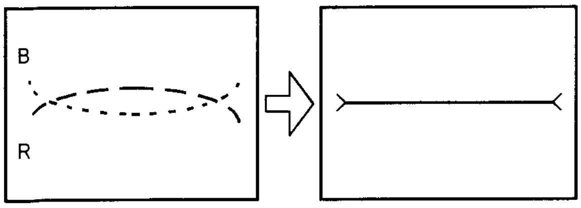
⑤ Four-pole magnet B



Beams are twisted lefthand

Beams are twisted righthand

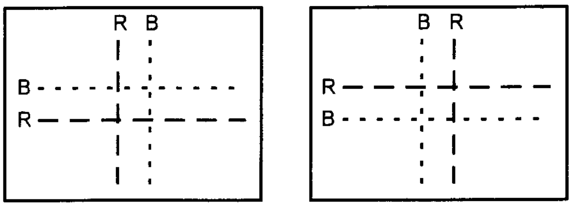
For example lefthand



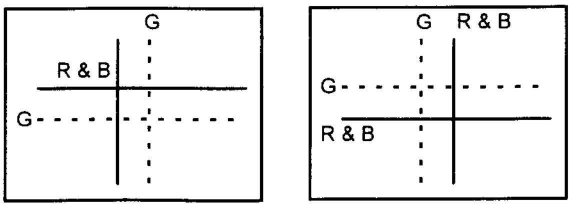
With four-pole magnet B ⑤

With four-pole magnet A ⑥

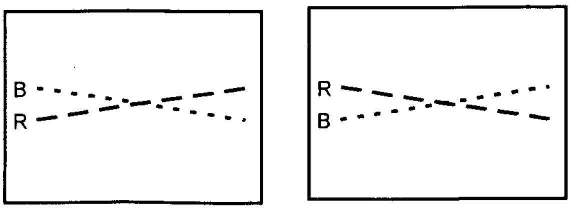
⑥ Four-pole magnet A



⑦ Six-pole magnet

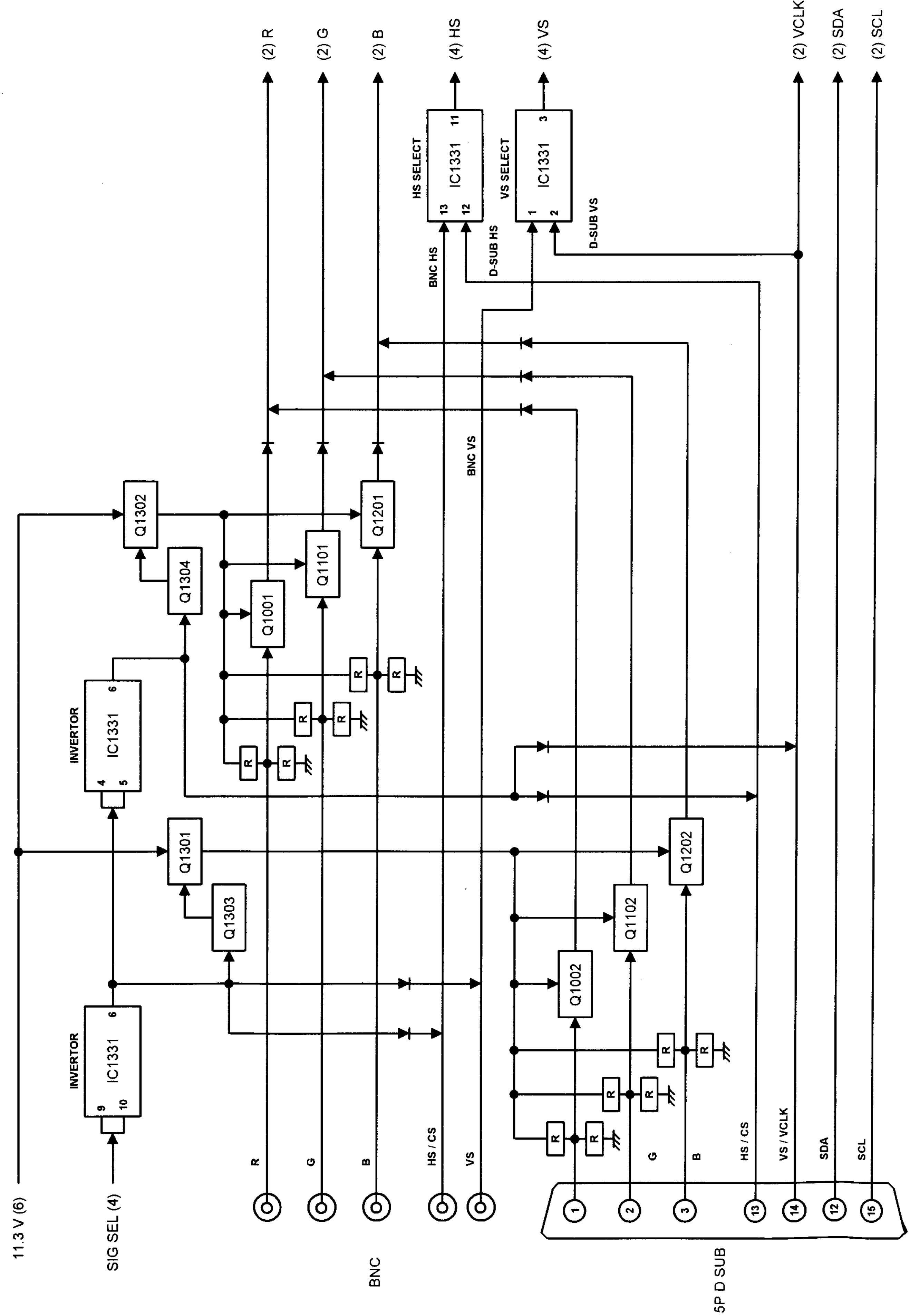

G
R & B
G
G
R & B
G
R & B

⑧ Differential Coil



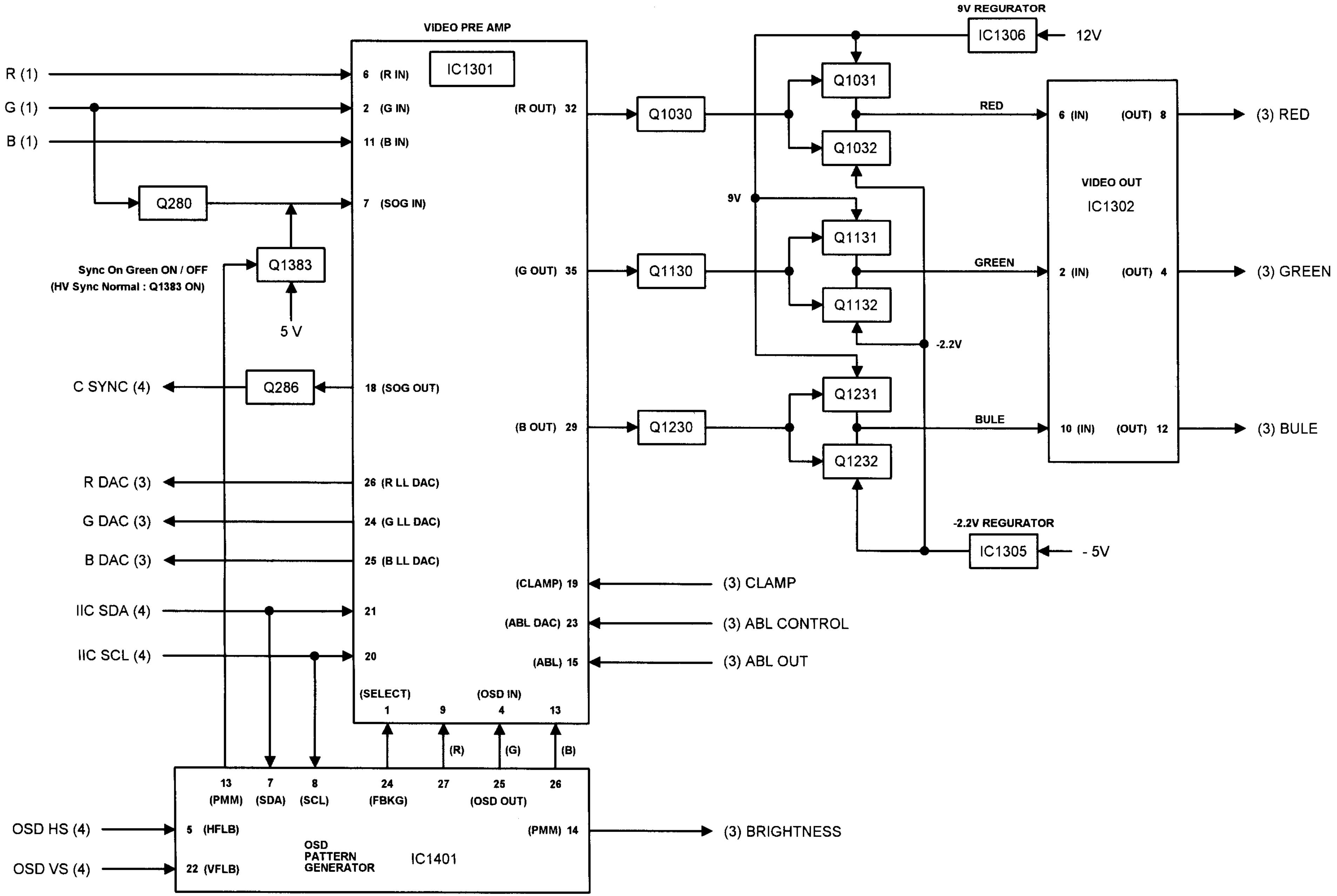
BLOCK DIAGRAM

SHEET (1) / VIDEO AMP for HV10S

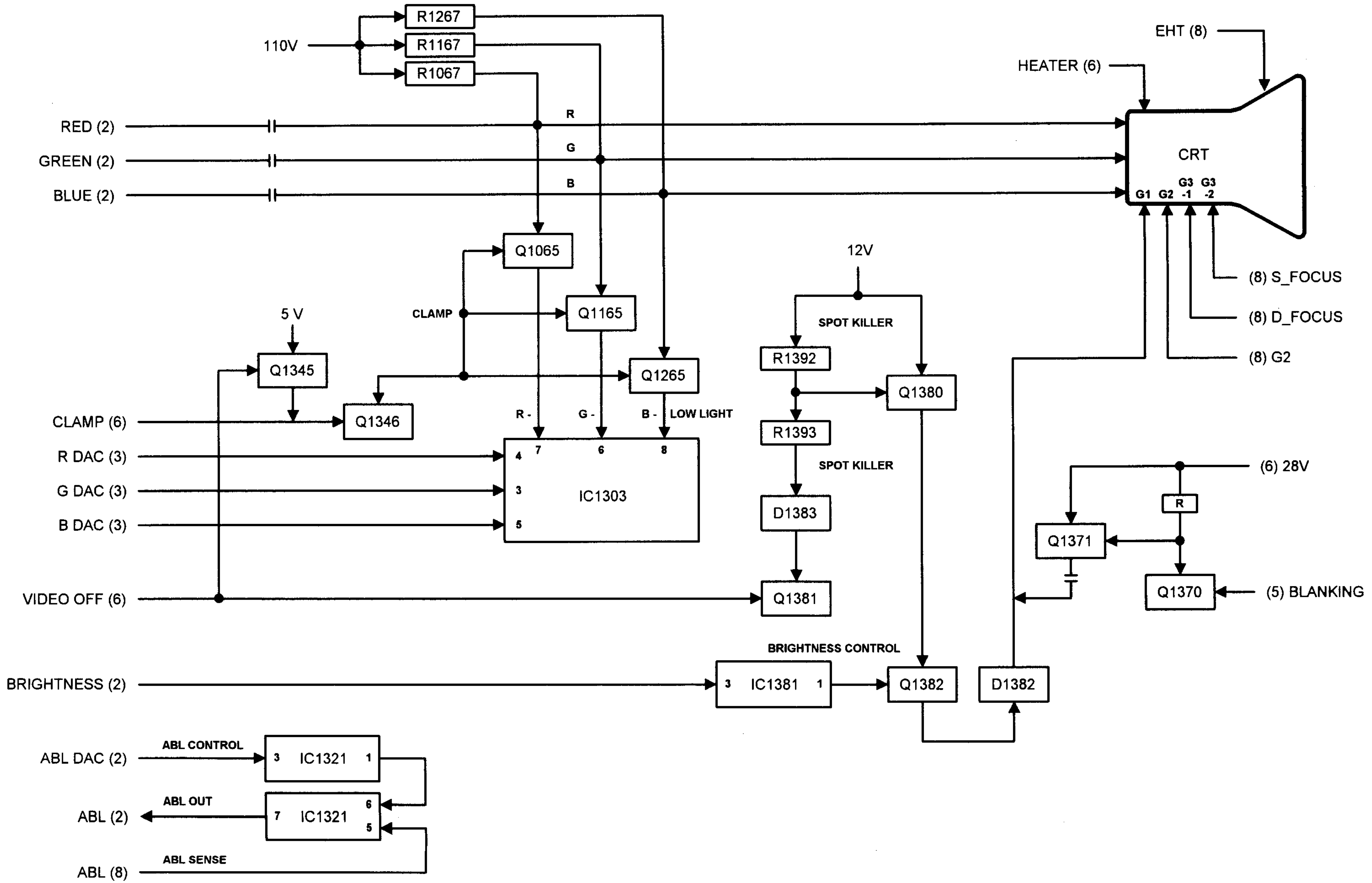


11.3 V (6)
SIG SEL (4)
INVERTOR
IC1331
9
10
6
4
5
Q1301
Q1302
Q1303
Q1304
Q1001
Q1002
Q1101
Q1102
Q1201
Q1202
R
G
B
HS / CS
VS
BNC
BNC HS
BNC VS
D-SUB HS
D-SUB VS
HS SELECT
VS SELECT
13
12
11
1
2
3
15P D SUB
1
2
3
13
14
12
15
VS / VCLK
SDA
SCL
(2) R
(2) G
(2) B
(4) HS
(4) VS
(2) VCLK
(2) SDA
(2) SCL

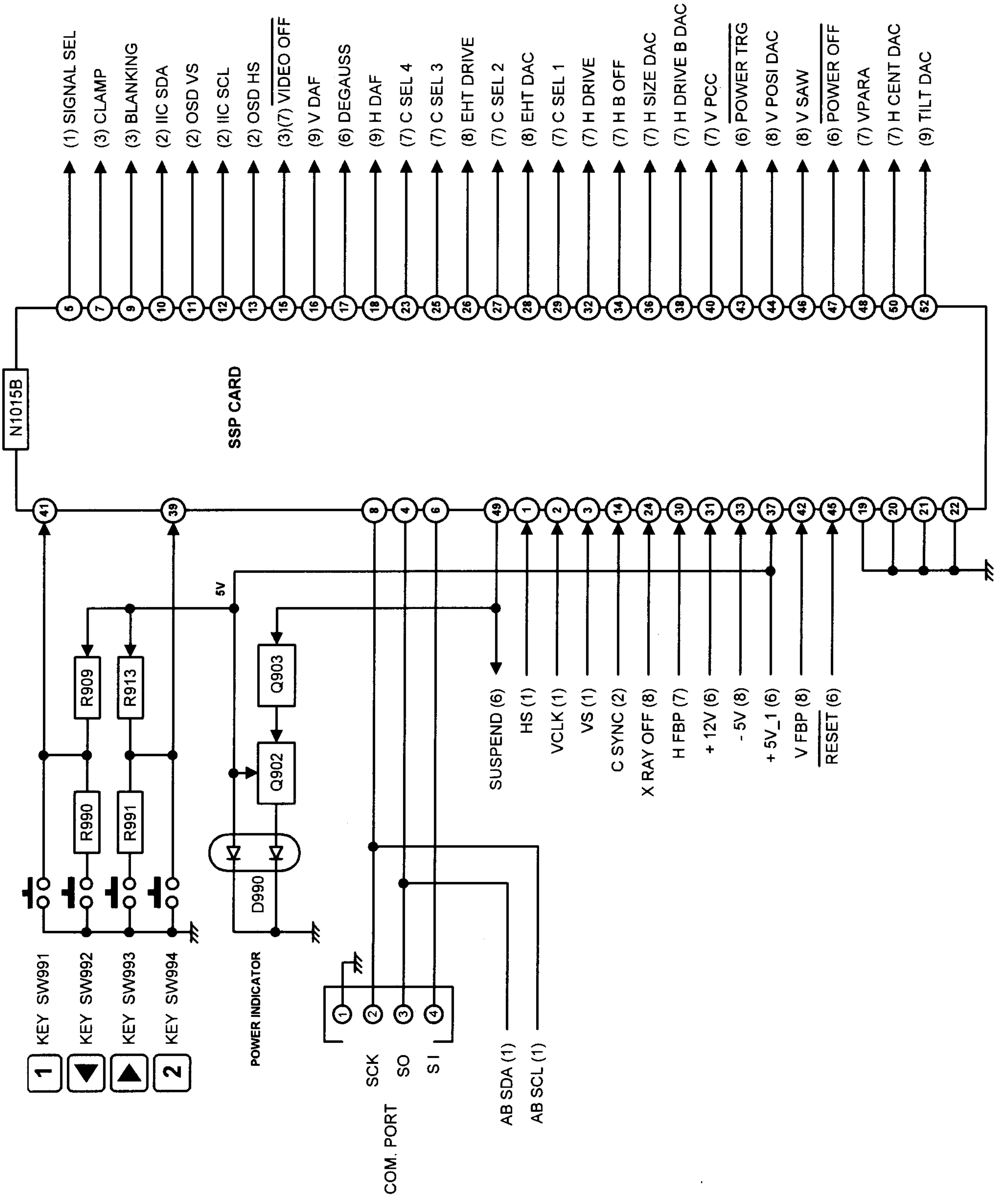
SHEET (2) / VIDEO OUT for HV10S


9V REGURATOR
IC1306
12V
VIDEO PRE AMP
IC1301
R (1)
G (1)
B (1)
6 (R IN)
2 (G IN)
11 (B IN)
7 (SOG IN)
(R OUT) 32
(G OUT) 35
(B OUT) 29
Q280
Q1383
Sync On Green ON / OFF
(HV Sync Normal : Q1383 ON)
5 V
C SYNC (4)
Q286
18 (SOG OUT)
Q1030
Q1130
Q1230
Q1031
Q1032
Q1131
Q1132
Q1231
Q1232
9V
-2.2V
RED
GREEN
BULE
VIDEO OUT
IC1302
6 (IN)
(OUT) 8
2 (IN)
(OUT) 4
10 (IN)
(OUT) 12
(3) RED
(3) GREEN
(3) BULE
-2.2V REGURATOR
IC1305
- 5V
R DAC (3)
G DAC (3)
B DAC (3)
26 (R LL DAC)
24 (G LL DAC)
25 (B LL DAC)
(CLAMP) 19
(ABL DAC) 23
(ABL) 15
(3) CLAMP
(3) ABL CONTROL
(3) ABL OUT
IIC SDA (4)
IIC SCL (4)
21
20
(SELECT)
1
9
(OSD IN)
4
13
(R)
(G)
(B)
13
(PMM)
7
(SDA)
8
(SCL)
24
(FBKG)
27
25
(OSD OUT)
26
OSD HS (4)
OSD VS (4)
5 (HFLB)
22 (VFLB)
OSD
PATTERN
GENERATOR
IC1401
(PMM) 14
(3) BRIGHTNESS

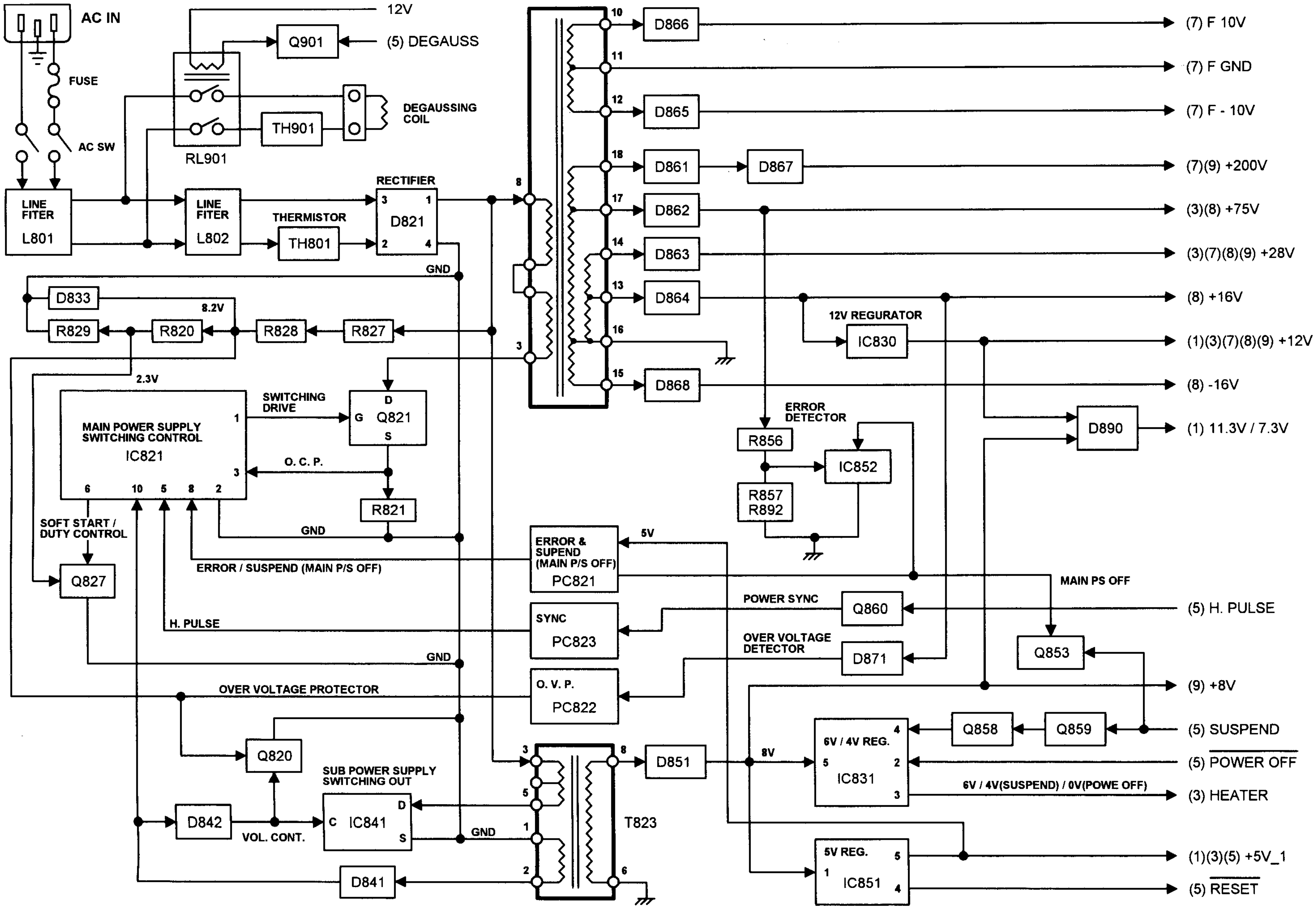
SHEET (3) / VIDEO OUT for HV10S


110V
R1267
R1167
R1067
EHT (8)
HEATER (6)
RED (2)
GREEN (2)
BLUE (2)
R
G
B
CRT
G1 G2 G3 -1 G3 -2
Q1065
Q1165
Q1265
12V
(8) S_FOCUS
(8) D_FOCUS
(8) G2
5 V
CLAMP
Q1345
Q1346
SPOT KILLER
R1392
Q1380
R1393
SPOT KILLER
CLAMP (6)
R -
G -
B -
LOW LIGHT
R DAC (3)
G DAC (3)
B DAC (3)
4
7
6
8
3
5
IC1303
D1383
(6) 28V
R
Q1371
Q1370
(5) BLANKING
VIDEO OFF (6)
Q1381
BRIGHTNESS CONTROL
BRIGHTNESS (2)
3
IC1381
1
Q1382
D1382
ABL CONTROL
ABL DAC (2)
3
IC1321
1
ABL OUT
ABL (2)
7
IC1321
6
5
ABL SENSE
ABL (8)

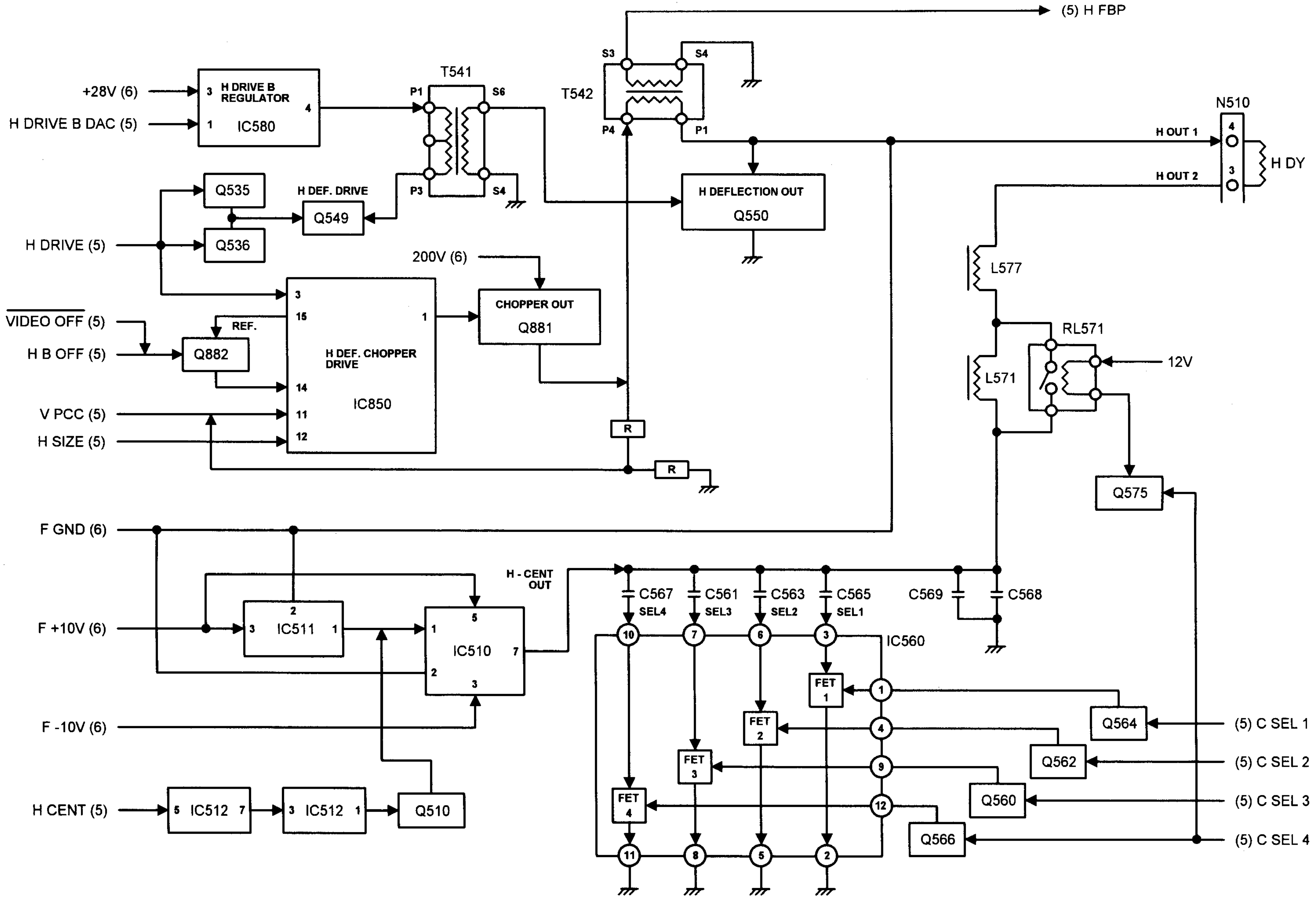
SHEET (4)(5) / SSP CARD for HV10S


N1015B
SSP CARD
(1) SIGNAL SEL
(3) CLAMP
(3) BLANKING
(2) IIC SDA
(2) OSD VS
(2) IIC SCL
(2) OSD HS
(3)(7) VIDEO OFF
(9) V DAF
(6) DEGAUSS
(9) H DAF
(7) C SEL 4
(7) C SEL 3
(8) EHT DRIVE
(7) C SEL 2
(8) EHT DAC
(7) C SEL 1
(7) H DRIVE
(7) H B OFF
(7) H SIZE DAC
(7) H DRIVE B DAC
(7) V PCC
(6) POWER TRG
(8) V POSI DAC
(8) V SAW
(6) POWER OFF
(7) VPARA
(7) H CENT DAC
(9) TILT DAC
5
7
9
10
11
12
13
15
16
17
18
23
25
26
27
28
29
32
34
36
38
40
43
44
46
47
48
50
52
41
39
8
4
6
49
1
2
3
14
24
30
31
33
37
42
45
19
20
21
22
SUSPEND (6)
HS (1)
VCLK (1)
VS (1)
C SYNC (2)
X RAY OFF (8)
H FBP (7)
+ 12V (6)
- 5V (8)
+ 5V_1 (6)
V FBP (8)
RESET (6)
5V
R909
R913
R990
R991
Q903
Q902
D990
1
KEY SW991
KEY SW992
KEY SW993
2
KEY SW994
POWER INDICATOR
1
2
3
4
SCK
SO
S I
COM. PORT
AB SDA (1)
AB SCL (1)

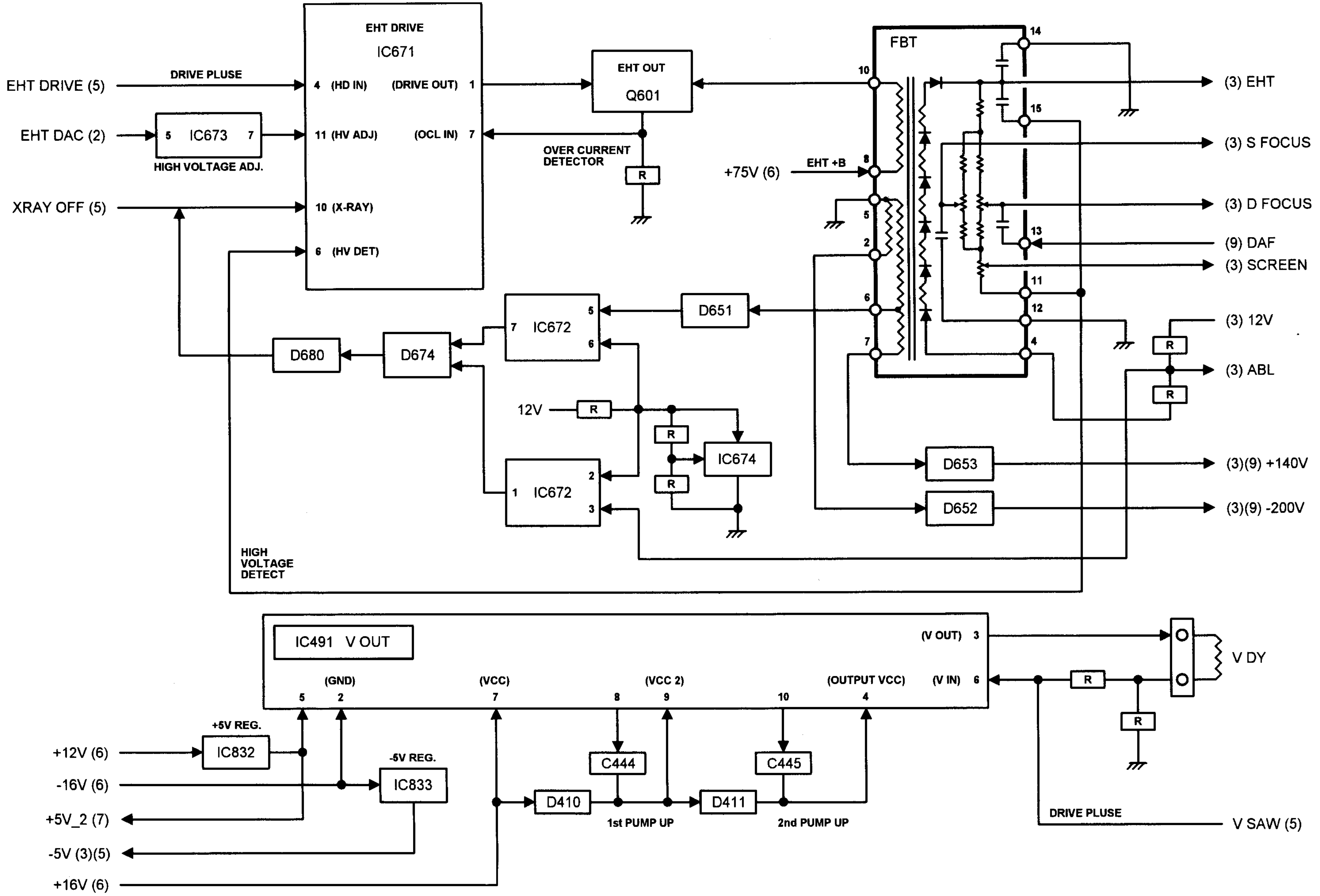
SHEET (6) / POWER SUPPLY for HV10S


AC IN
FUSE
AC SW
LINE FITER
L801
LINE FITER
L802
RL901
12V
Q901
(5) DEGAUSS
TH901
DEGAUSSING COIL
THERMISTOR
TH801
RECTIFIER
D821
3
1
2
4
GND
D833
8.2V
R829
R820
R828
R827
2.3V
MAIN POWER SUPPLY SWITCHING CONTROL
IC821
1
3
6
10
5
8
2
SWITCHING DRIVE
D
G
Q821
S
O. C. P.
R821
GND
SOFT START / DUTY CONTROL
Q827
ERROR / SUSPEND (MAIN P/S OFF)
H. PULSE
GND
OVER VOLTAGE PROTECTOR
Q820
SUB POWER SUPPLY SWITCHING OUT
IC841
D
C
S
GND
D842
VOL. CONT.
D841
8
3
10
11
12
18
17
14
13
16
15
D866
D865
D861
D867
D862
D863
D864
D868
12V REGURATOR
IC830
ERROR DETECTOR
R856
IC852
R857
R892
D890
ERROR & SUPEND (MAIN P/S OFF)
PC821
5V
SYNC
PC823
O. V. P.
PC822
POWER SYNC
Q860
OVER VOLTAGE DETECTOR
D871
MAIN PS OFF
Q853
T823
3
5
1
2
8
6
D851
8V
6V / 4V REG.
IC831
4
5
2
3
Q858
Q859
6V / 4V(SUSPEND) / 0V(POWE OFF)
5V REG.
IC851
5
1
4
(7) F 10V
(7) F GND
(7) F - 10V
(7)(9) +200V
(3)(8) +75V
(3)(7)(8)(9) +28V
(8) +16V
(1)(3)(7)(8)(9) +12V
(8) -16V
(1) 11.3V / 7.3V
(5) H. PULSE
(9) +8V
(5) SUSPEND
(5) POWER OFF
(3) HEATER
(1)(3)(5) +5V_1
(5) RESET

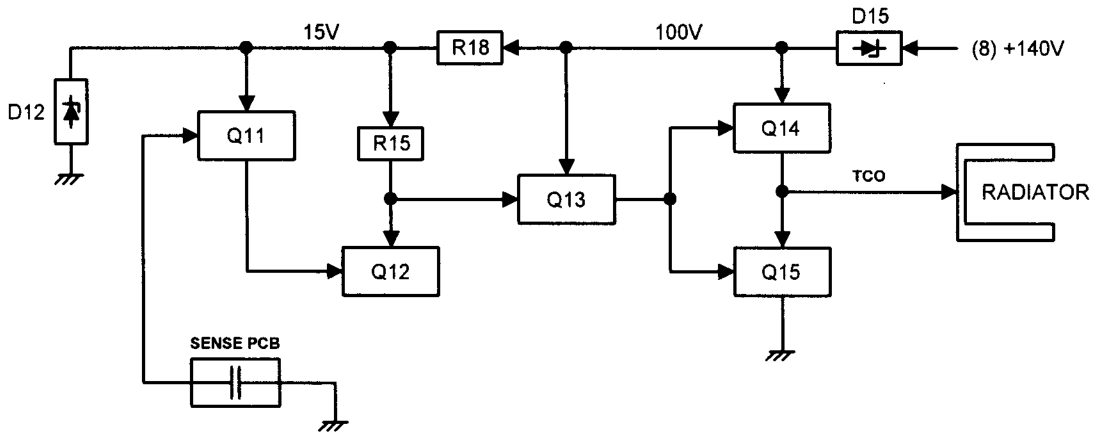
SHEET (7) / HORIZONTAL DEFLECTION for HV10S

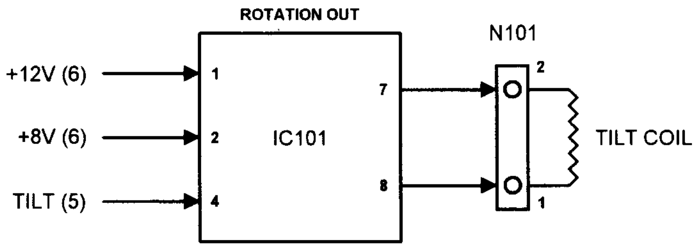

(5) H FBP
+28V (6)
H DRIVE B DAC (5)
H DRIVE B REGULATOR
IC580
3
1
4
T541
P1
S6
P3
S4
T542
S3
S4
P4
P1
N510
H OUT 1
H OUT 2
4
3
H DY
Q535
Q536
H DEF. DRIVE
Q549
H DRIVE (5)
H DEFLECTION OUT
Q550
200V (6)
CHOPPER OUT
Q881
VIDEO OFF (5)
H B OFF (5)
REF.
Q882
H DEF. CHOPPER DRIVE
IC850
3
15
1
14
11
12
V PCC (5)
H SIZE (5)
R
R
L577
RL571
L571
12V
Q575
F GND (6)
F +10V (6)
F -10V (6)
H CENT (5)
IC511
2
3
1
IC510
5
1
2
3
7
H - CENT OUT
IC512
5
7
IC512
3
1
Q510
C567
C561
C563
C565
C569
C568
SEL4
SEL3
SEL2
SEL1
IC560
10
7
6
3
1
4
9
12
11
8
5
2
FET 1
FET 2
FET 3
FET 4
Q564
Q562
Q560
Q566
(5) C SEL 1
(5) C SEL 2
(5) C SEL 3
(5) C SEL 4

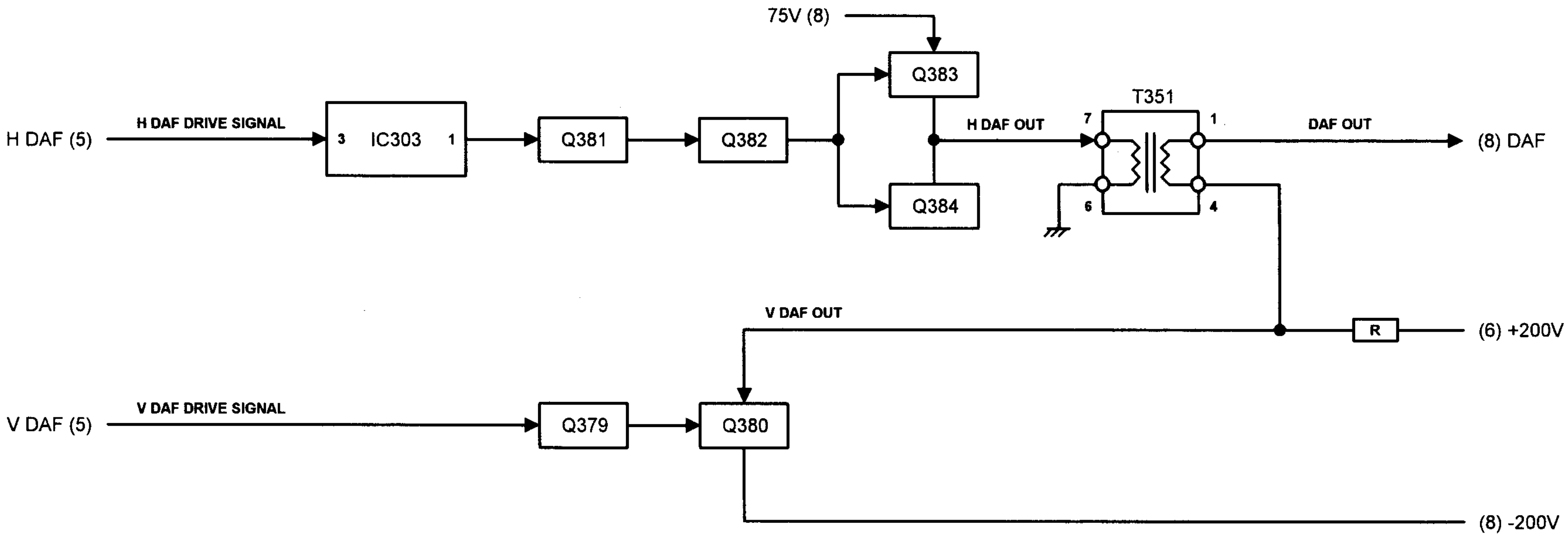
SHEET (8) / EHT OUT for HV10S

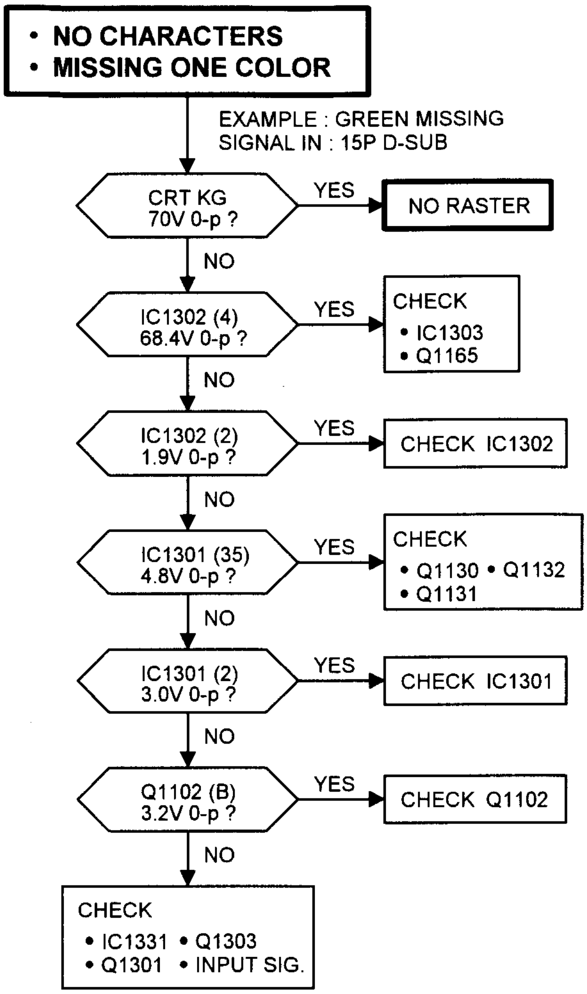

EHT DRIVE
IC671
EHT DRIVE (5)
DRIVE PLUSE
4 (HD IN)
(DRIVE OUT) 1
EHT DAC (2)
5 IC673 7
HIGH VOLTAGE ADJ.
11 (HV ADJ)
(OCL IN) 7
XRAY OFF (5)
10 (X-RAY)
6 (HV DET)
EHT OUT
Q601
OVER CURRENT DETECTOR
R
FBT
10
8
5
2
6
7
14
15
13
11
12
4
+75V (6)
EHT +B
(3) EHT
(3) S FOCUS
(3) D FOCUS
(9) DAF
(3) SCREEN
(3) 12V
(3) ABL
(3)(9) +140V
(3)(9) -200V
D651
D653
D652
5 IC672 6
7
1 IC672
2
3
12V
IC674
D674
D680
HIGH VOLTAGE DETECT
IC491 V OUT
(V OUT) 3
(V IN) 6
(GND) 2
5
(VCC) 7
8
(VCC 2) 9
10
(OUTPUT VCC) 4
+5V REG.
IC832
-5V REG.
IC833
C444
C445
D410
D411
1st PUMP UP
2nd PUMP UP
+12V (6)
-16V (6)
+5V_2 (7)
-5V (3)(5)
+16V (6)
V DY
DRIVE PLUSE
V SAW (5)

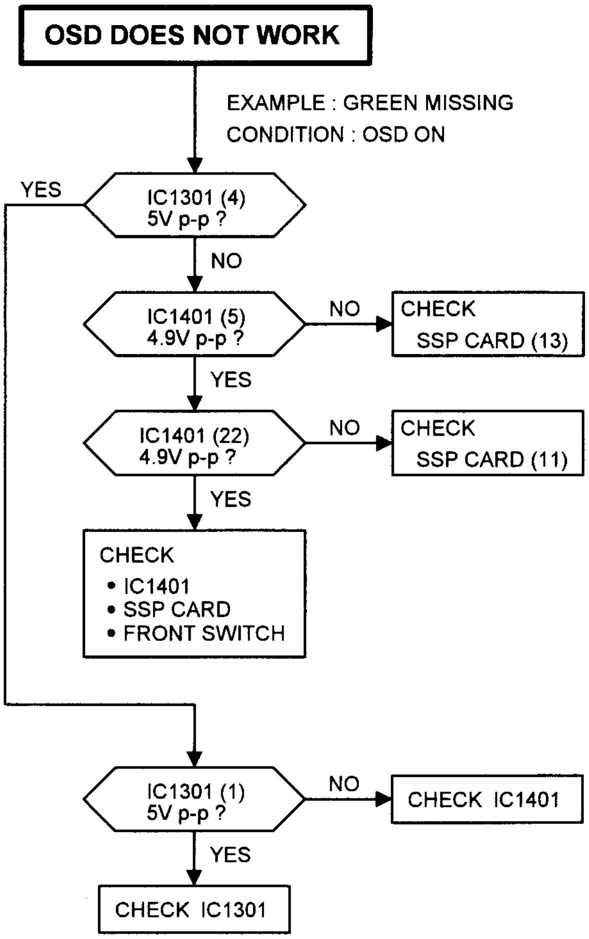
SHEET (9) DAF OUT / TILT CONTROL / TCO for HV10S

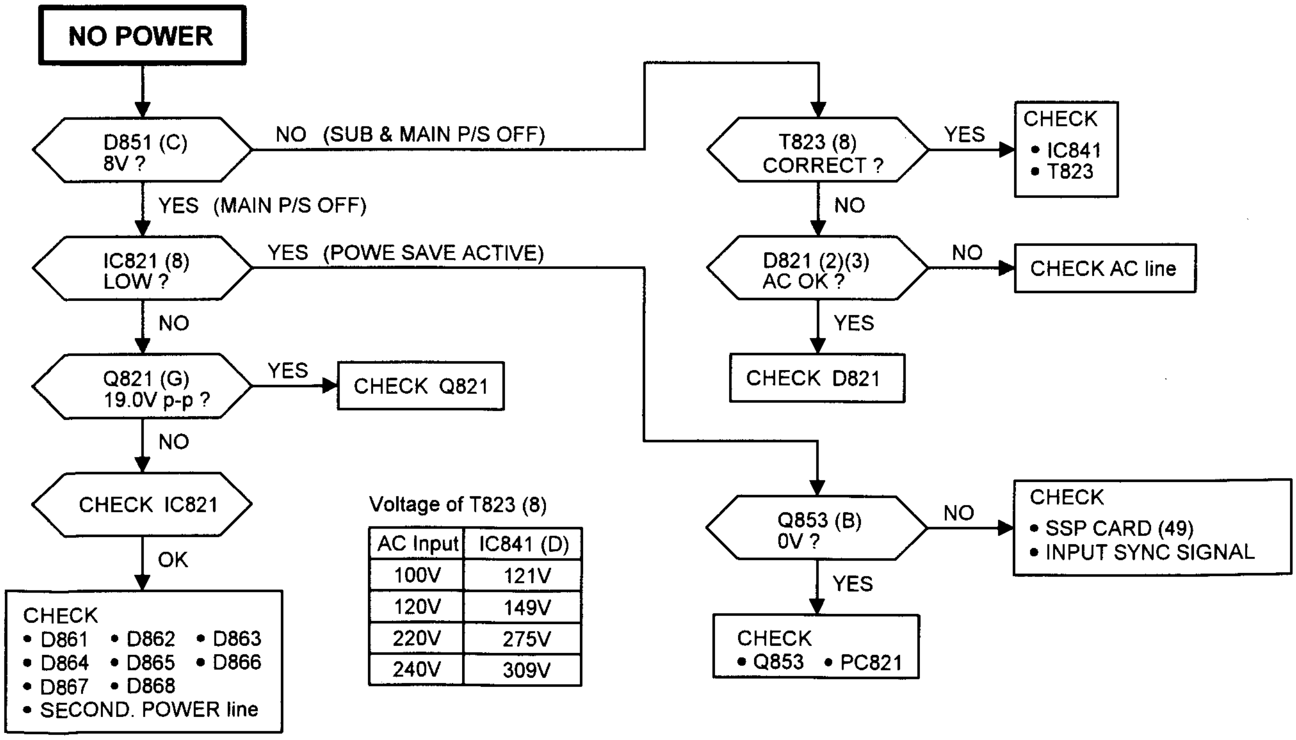

15V
100V
D15
(8) +140V
D12
R18
R15
Q11
Q12
Q13
Q14
Q15
TCO
RADIATOR
SENSE PCB


ROTATION OUT
N101
+12V (6)
+8V (6)
TILT (5)
1
2
4
IC101
7
8
2
1
TILT COIL


75V (8)
H DAF (5)
H DAF DRIVE SIGNAL
3
IC303
1
Q381
Q382
Q383
Q384
H DAF OUT
T351
7
1
6
4
DAF OUT
(8) DAF
V DAF OUT
R
(6) +200V
V DAF (5)
V DAF DRIVE SIGNAL
Q379
Q380
(8) -200V

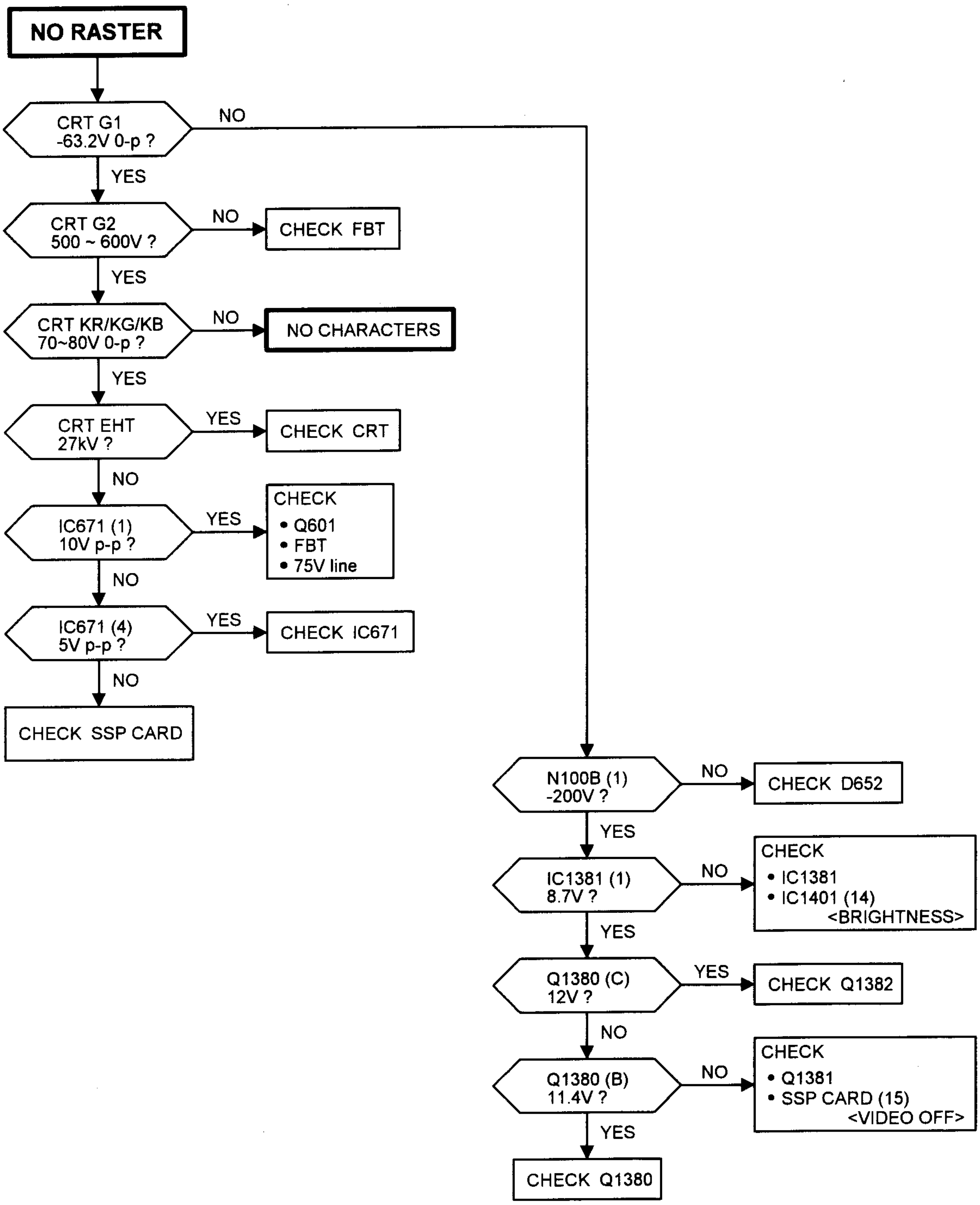

• NO CHARACTERS
• MISSING ONE COLOR
EXAMPLE : GREEN MISSING
SIGNAL IN : 15P D-SUB
CRT KG 70V 0-p ?
YES
NO RASTER
NO
IC1302 (4) 68.4V 0-p ?
YES
CHECK • IC1303 • Q1165
NO
IC1302 (2) 1.9V 0-p ?
YES
CHECK IC1302
NO
IC1301 (35) 4.8V 0-p ?
YES
CHECK • Q1130 • Q1132 • Q1131
NO
IC1301 (2) 3.0V 0-p ?
YES
CHECK IC1301
NO
Q1102 (B) 3.2V 0-p ?
YES
CHECK Q1102
NO
CHECK • IC1331 • Q1303 • Q1301 • INPUT SIG.


OSD DOES NOT WORK
EXAMPLE : GREEN MISSING
CONDITION : OSD ON
IC1301 (4) 5V p-p ?
YES
NO
IC1401 (5) 4.9V p-p ?
NO
CHECK SSP CARD (13)
YES
IC1401 (22) 4.9V p-p ?
NO
CHECK SSP CARD (11)
YES
CHECK • IC1401 • SSP CARD • FRONT SWITCH
IC1301 (1) 5V p-p ?
NO
CHECK IC1401
YES
CHECK IC1301


NO POWER
D851 (C) 8V ?
NO (SUB & MAIN P/S OFF)
YES (MAIN P/S OFF)
IC821 (8) LOW ?
YES (POWE SAVE ACTIVE)
NO
Q821 (G) 19.0V p-p ?
YES
CHECK Q821
NO
CHECK IC821
OK
CHECK • D861 • D862 • D863 • D864 • D865 • D866 • D867 • D868 • SECOND. POWER line
T823 (8) CORRECT ?
YES
CHECK • IC841 • T823
NO
D821 (2)(3) AC OK ?
NO
CHECK AC line
YES
CHECK D821
Q853 (B) 0V ?
NO
CHECK • SSP CARD (49) • INPUT SYNC SIGNAL
YES
CHECK • Q853 • PC821

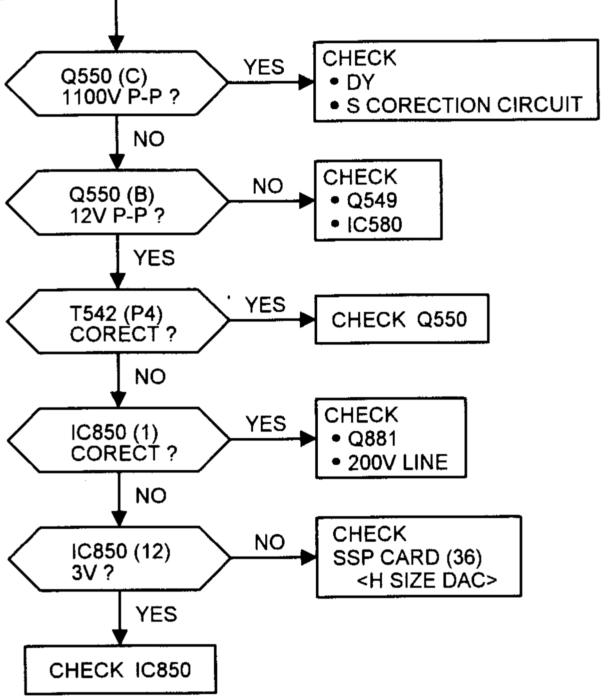
Voltage of T823 (8)

AC Input	IC841 (D)
100V	121V
120V	149V
220V	275V
240V	309V


NO RASTER
CRT G1
-63.2V 0-p ?
NO
YES
CRT G2
500 ~ 600V ?
NO
CHECK FBT
YES
CRT KR/KG/KB
70~80V 0-p ?
NO
NO CHARACTERS
YES
CRT EHT
27kV ?
YES
CHECK CRT
NO
IC671 (1)
10V p-p ?
YES
CHECK
• Q601
• FBT
• 75V line
NO
IC671 (4)
5V p-p ?
YES
CHECK IC671
NO
CHECK SSP CARD
N100B (1)
-200V ?
NO
CHECK D652
YES
IC1381 (1)
8.7V ?
NO
CHECK
• IC1381
• IC1401 (14)
<BRIGHTNESS>
YES
Q1380 (C)
12V ?
YES
CHECK Q1382
NO
Q1380 (B)
11.4V ?
NO
CHECK
• Q1381
• SSP CARD (15)
<VIDEO OFF>
YES
CHECK Q1380

INCORRECT H SIZE

SIGNAL : MODE -1

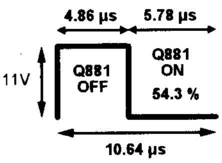

Q550 (C) 1100V P-P ?
YES
CHECK
• DY
• S CORECTION CIRCUIT
NO
Q550 (B) 12V P-P ?
NO
CHECK
• Q549
• IC580
YES
T542 (P4) CORECT ?
YES
CHECK Q550
NO
IC850 (1) CORECT ?
YES
CHECK
• Q881
• 200V LINE
NO
IC850 (12) 3V ?
NO
CHECK
SSP CARD (36)
<H SIZE DAC>
YES
CHECK IC850

Voltage of T542 (P4)

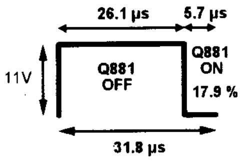
	f H	Value
MODE - 1	93.8 kHz	126.5V
MODE - 2	31.5 kHz	42.2V
MODE - 3	46.9 kHz	62.5V
MODE - 4	60.0 kHz	78.8V
MODE - 5	68.7 kHz	89.6V
MODE - 6	64.0 kHz	82.5V
MODE - 7	80.0 kHz	101.9V
MODE - 8	87.5 kHz	116.9V

IC850 (1) OUTPUT

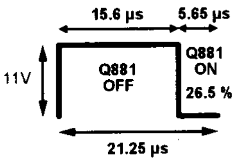
<MODE - 1 : 93.8 kHz>


4.86 µs
5.78 µs
11V
Q881 OFF
Q881 ON 54.3 %
10.64 µs

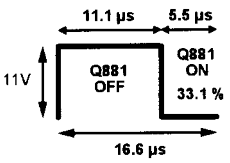
<MODE - 2 : 31.5 kHz>


26.1 µs
5.7 µs
11V
Q881 OFF
Q881 ON 17.9 %
31.8 µs

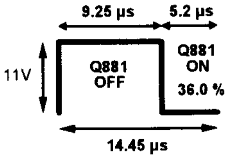
<MODE - 3 : 46.9 kHz>


15.6 µs
5.65 µs
11V
Q881 OFF
Q881 ON 26.5 %
21.25 µs

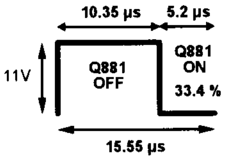
<MODE - 4 : 60.0 kHz>


11.1 µs
5.5 µs
11V
Q881 OFF
Q881 ON 33.1 %
16.6 µs

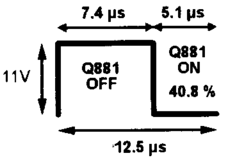
<MODE - 5 : 68.7 kHz>


9.25 µs
5.2 µs
11V
Q881 OFF
Q881 ON 36.0 %
14.45 µs

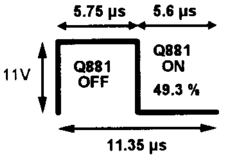
<MODE - 6 : 64.0 kHz>


10.35 µs
5.2 µs
11V
Q881 OFF
Q881 ON 33.4 %
15.55 µs

<MODE - 7 : 80.0 kHz>


7.4 µs
5.1 µs
11V
Q881 OFF
Q881 ON 40.8 %
12.5 µs

<MODE - 8 : 87.5 kHz>

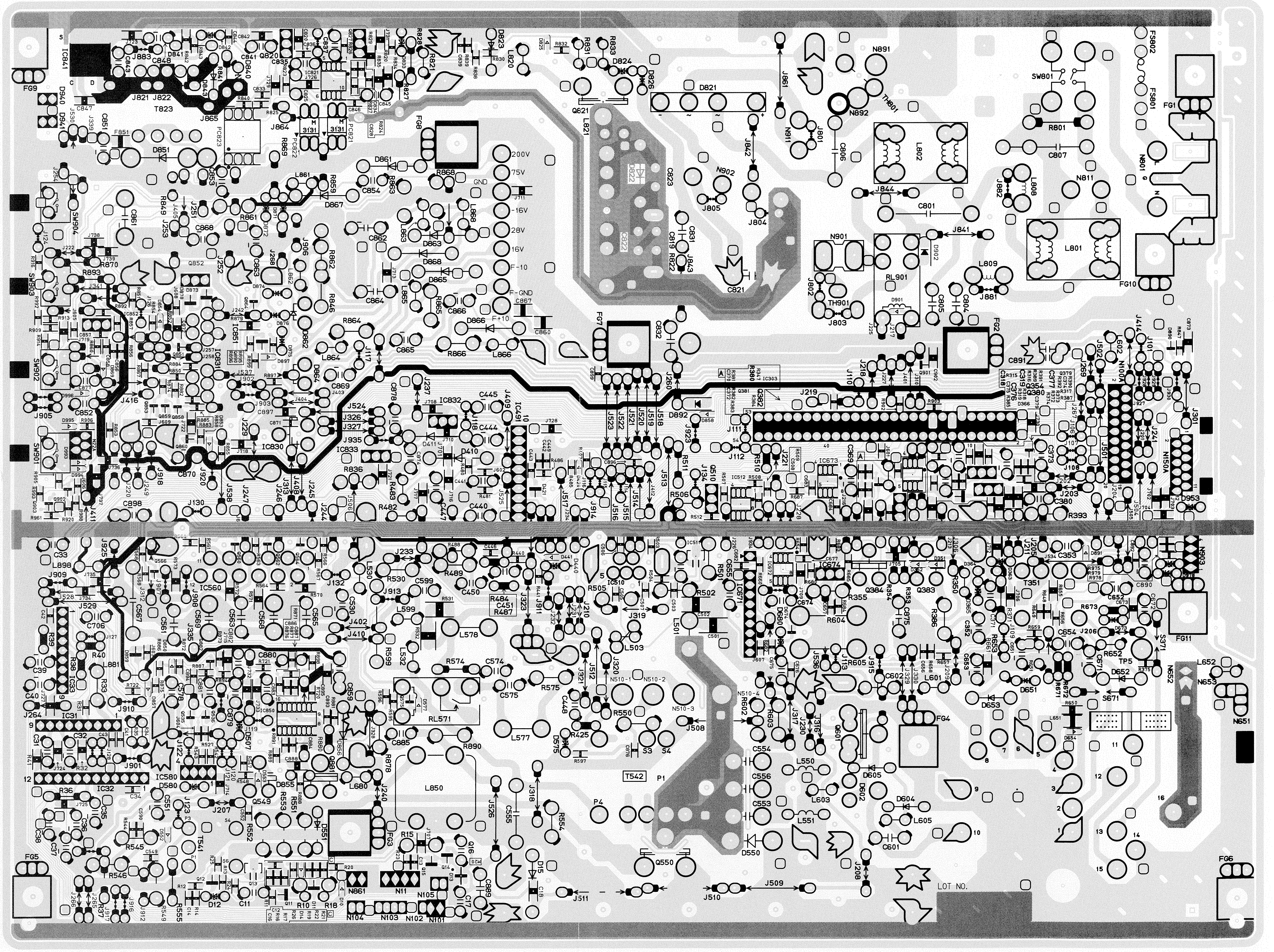

5.75 µs
5.6 µs
11V
Q881 OFF
Q881 ON 49.3 %
11.35 µs

IC560 ①④⑨⑫ VOLTAGE

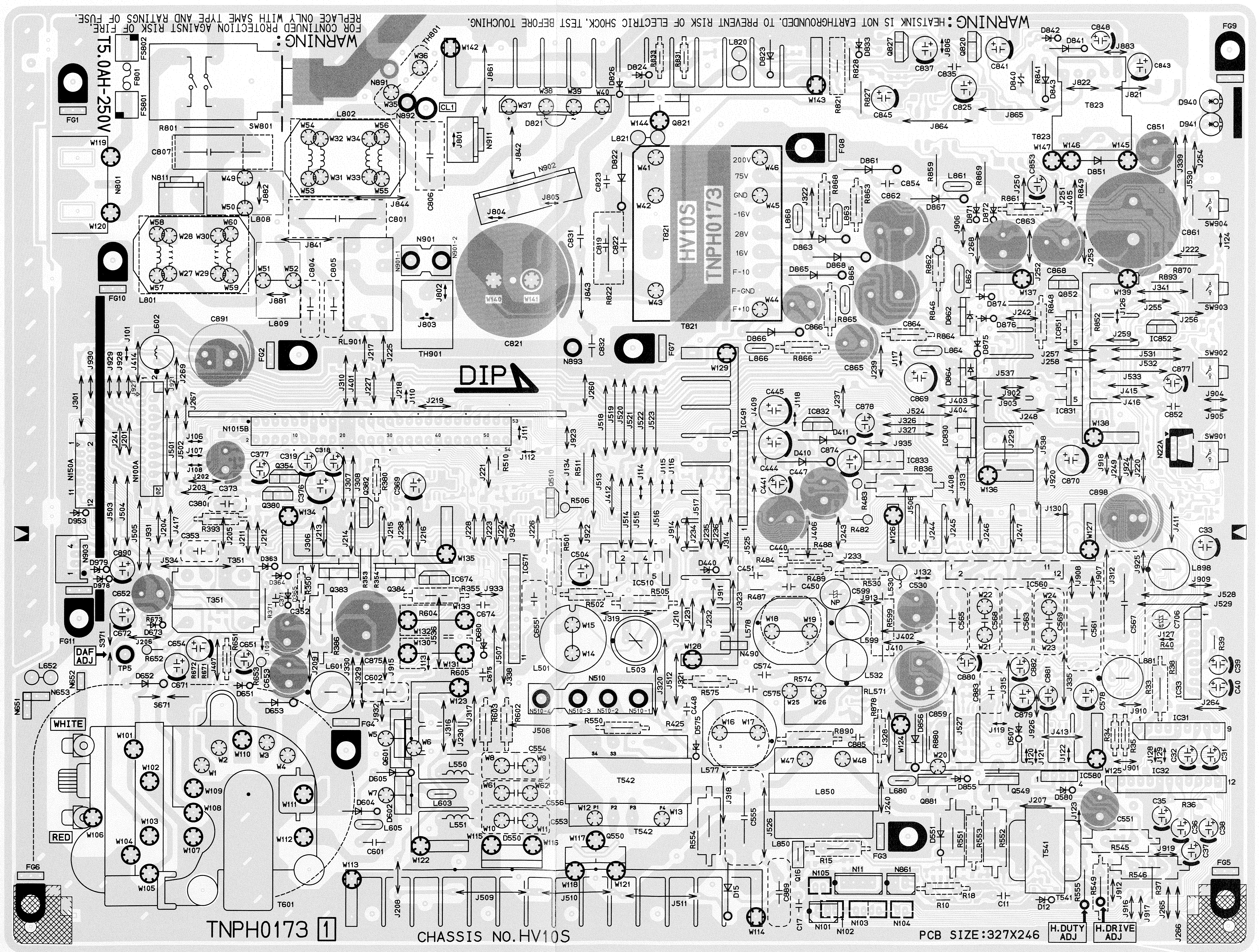
SIGNAL	f H	Pin #1	Pin #4	Pin #9	Pin #12	Total Cap.
MODE-1	93.8 kHz	0 V	0 V	0 V	0 V	0.30µF
MODE-2	31.5 kHz	0 V	12 V	12 V	12 V	3.28µF
MODE-3	46.9 kHz	12 V	0 V	12 V	0 V	1.27µF
MODE-4	60.0 kHz	12 V	12 V	0 V	0 V	0.81µF
MODE-5	68.7 kHz	0 V	12 V	0 V	0 V	0.66µF
MODE-6	64.0 kHz	12 V	12 V	0 V	0 V	0.81µF
MODE-7	80.0 kHz	12 V	0 V	0 V	0 V	0.45µF
MODE-8	87.5 kHz	0 V	0V	0 V	0 V	0.30µF

CONDUCTOR VIEW

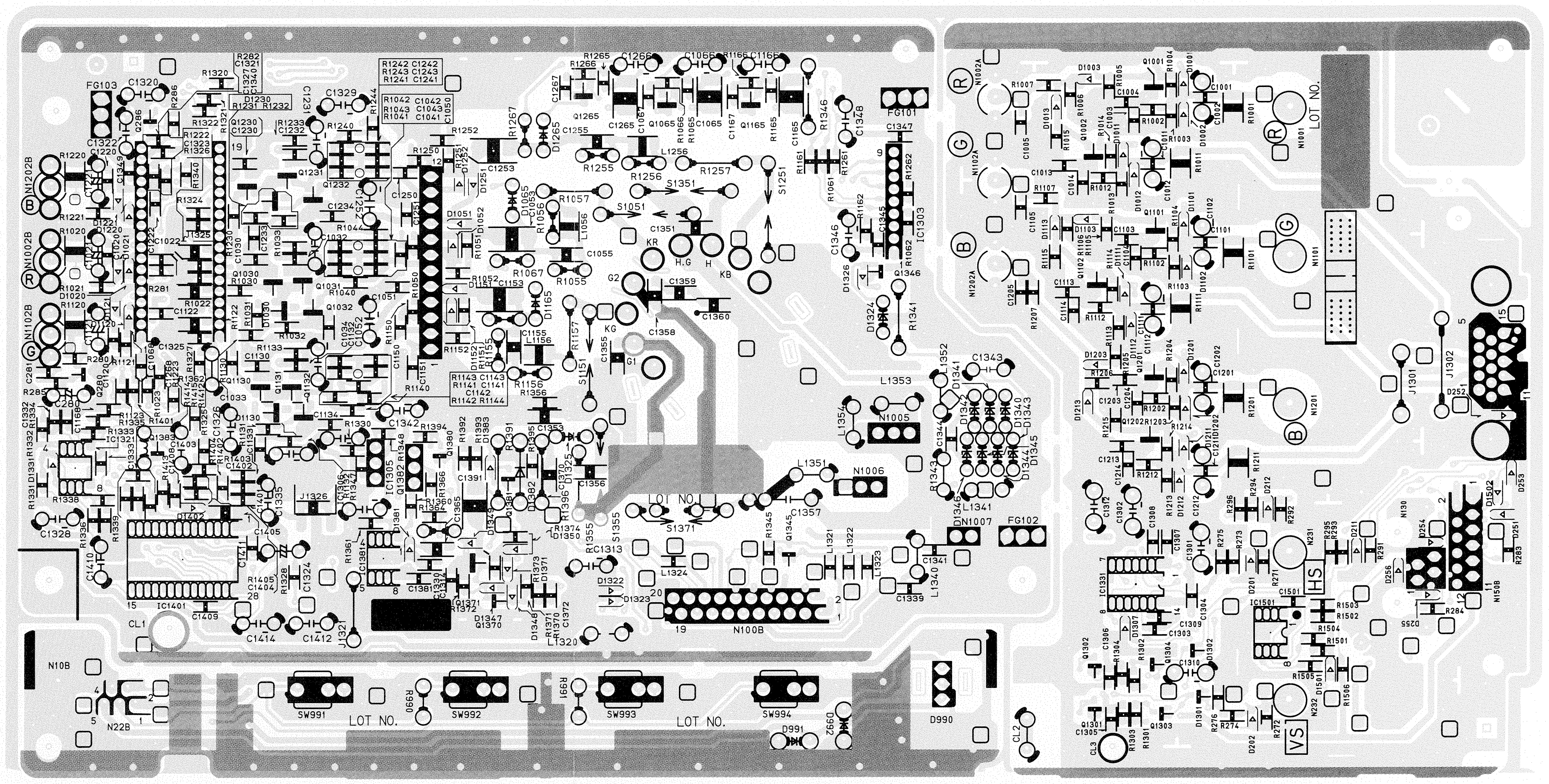
MAIN BOARD (Solder side)



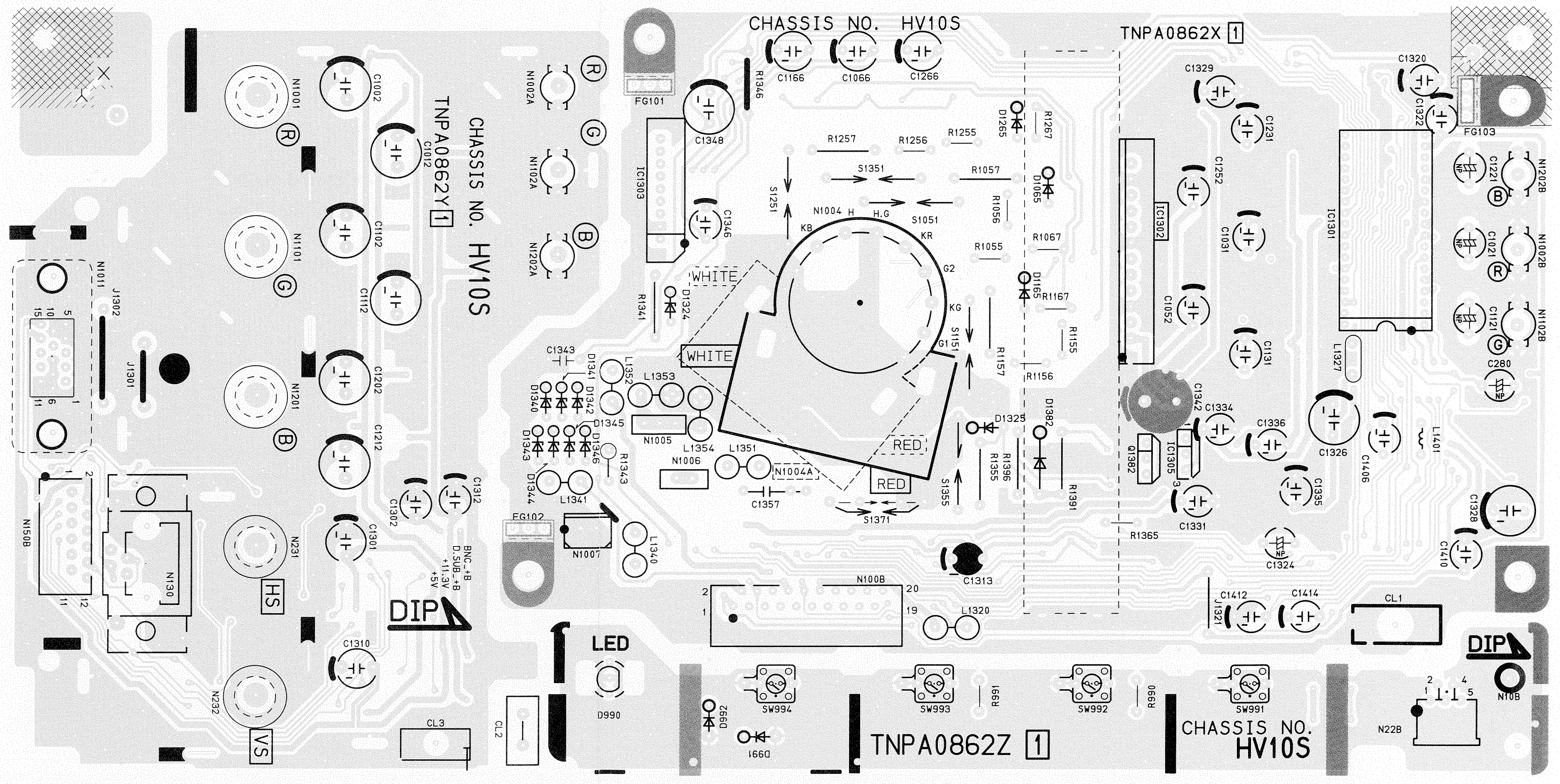
MAIN BOARD (Parts side)


WARNING: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE REPLACE ONLY WITH SAME TYPE AND RATINGS OF FUSE.
T5.0AH-250V
WARNING: HEATSINK IS NOT EARTHGROUNDED. TO PREVENT RISK OF ELECTRIC SHOCK, TEST BEFORE TOUCHING.
HV10S
TNPH0173
DIP
DAF ADJ
WHITE
RED
TNPH0173 1
CHASSIS NO.HV10S
PCB SIZE:327X246
H.DUTY ADJ
H.DRIVE ADJ

VIDEO BOARD (Solder side)


LOT NO.
SW991
SW992
SW993
SW994
N100B
FG101
FG102
FG103
IC1303
IC1401
D990
N228
N10B
CL1
CL2
CL3
HS
VS

VIDEO BOARD (Parts side)


CHASSIS NO. HV10S
TNPA0862X 1
TNPA0862Y 1
TNPA0862Z 1
CHASSIS NO. HV10S
DIP
LED
WHITE
RED
BNC +B
D.SUB +B
+11.5V
+5V
SW991
SW992
SW993
SW994
N100B
IC1301
IC1302
IC1303
D990
N228
N10B
HS
VS

SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE

The component identified by shading or international symbol ⚠ on the following schematic diagrams incorporate special features important for protection from X-Radiation, fire and electrical shock hazards. When servicing it is essential that only manufacturer's specified parts be used for those critical components.

NOTES :

1. RESISTOR

All resistors are carbon 1/4W resistor, unless otherwise noted by the following marks.
Unit of resistance is ohm (Ω), (K = 1,000, M = 1,000,000)

○ : Non Flammable
⊠ : Metal Oxide
□ : Wire Wound
⊗ : Fusible
⧄ : Flame Proof Rectangular

△ : Solid
◎ : Metal (Precision and high stability)
-■- : Thermistor
-▭- : Positive coefficient Thermistor

2. CAPACITOR

All capacitors are ceramic 50V capacitor, unless otherwise noted by the following marks.
Unit of capacitance is μF, unless otherwise noted.

+‖- : Electrolytic
Ⓣ : Tantalum
NP : Bipolar
Ⓢ : Polystyrene
⊗ : Temperature Compensation

Ⓜ : Polyester
ⓜ : Metalized Polyester
⊠ : Polypropylene
△ : Mica
○ : Ceramic
◎ : Ceramic (SL)

3. COIL

Unit of inductance is μH, unless otherwise noted.

4. VOLTAGE MEASUREMENT

Voltage is measured by a digital meter receiving normal signal.

5. This schematic diagram is the letest at the time of printing and is subject to change without notice.

SERVICE NOTES :

This model has a section that does not share a common ground with the power supply section. The different sections are referred to as the HOT section and the COLD section in the precautions below.

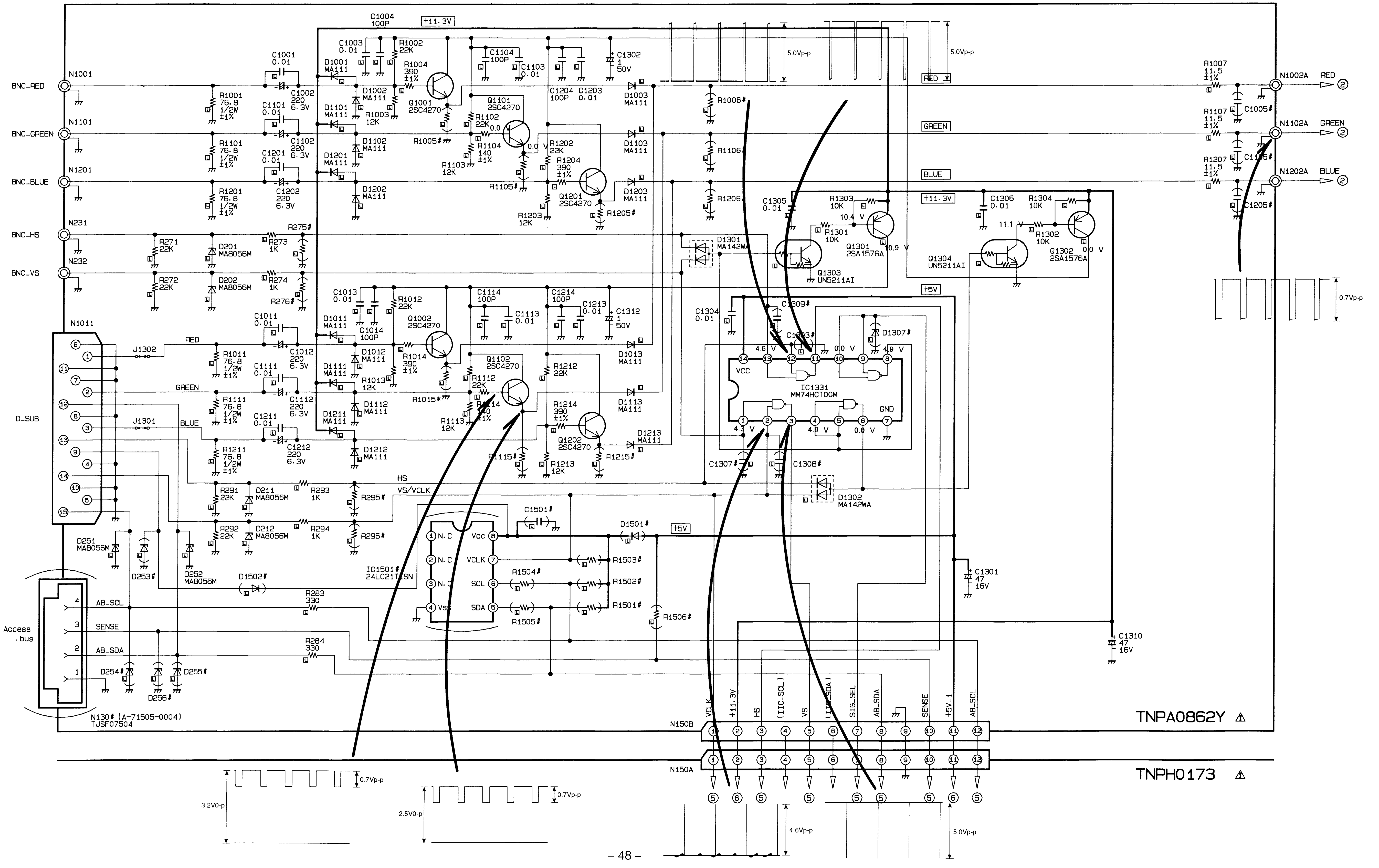
1. Do not touch the HOT section and the COLD section at the same time. You may receive an electric shock.
2. Do not short the HOT section to the COLD section. This could blow the fuse or damage parts.
3. Never measure the HOT section and the COLD section at the same time when using tools such as oscilloscopes or multimeters.
4. Always unplug the unit before beginning any operation such as removing the chassis.

SCHEMATIC DIAGRAM FOR MODEL No. :
TX-D1F63NM

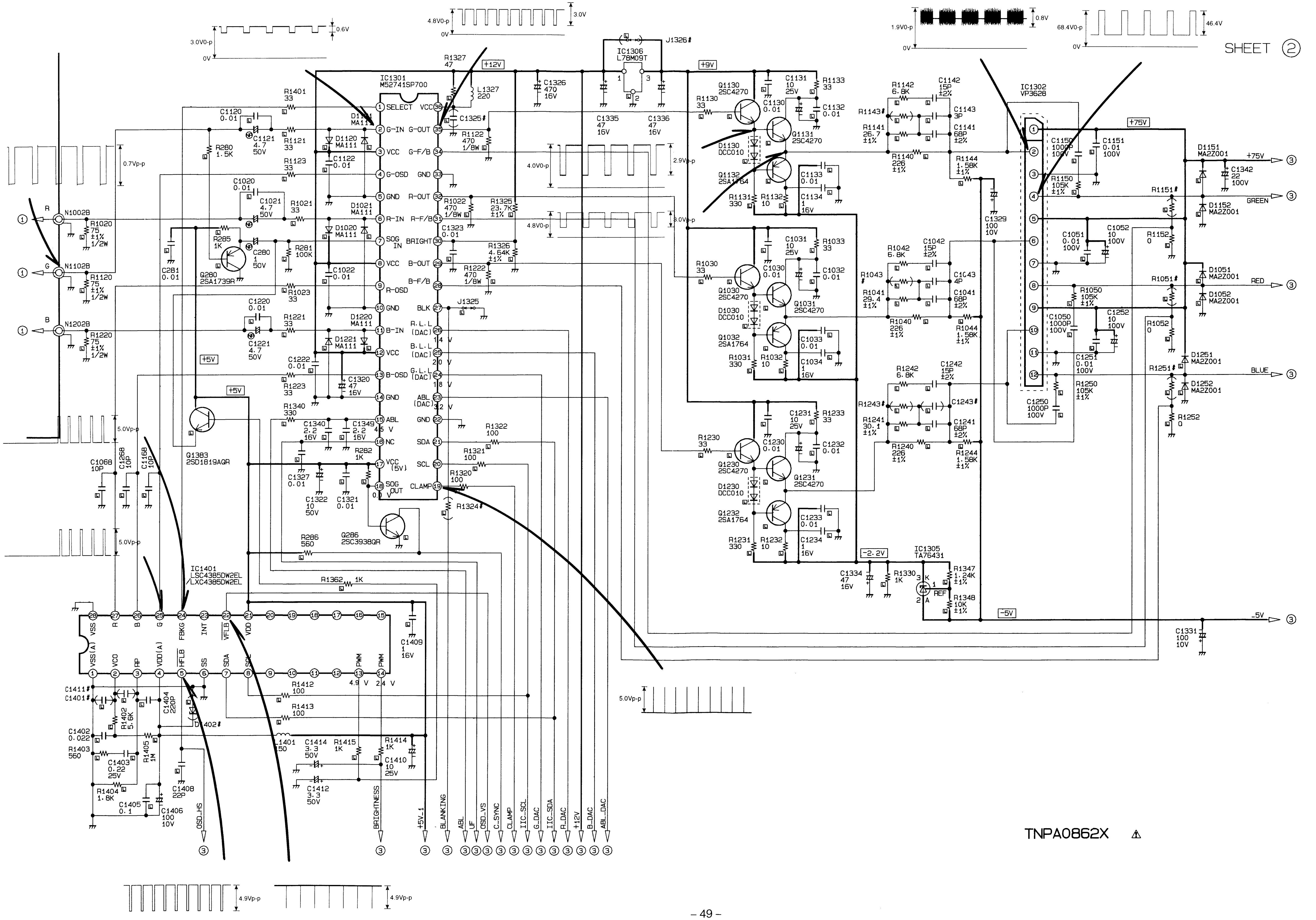
M-1F63TV

CHASSIS No. : HV10S
CHASSIS FAMILY NO. : 21HV10S

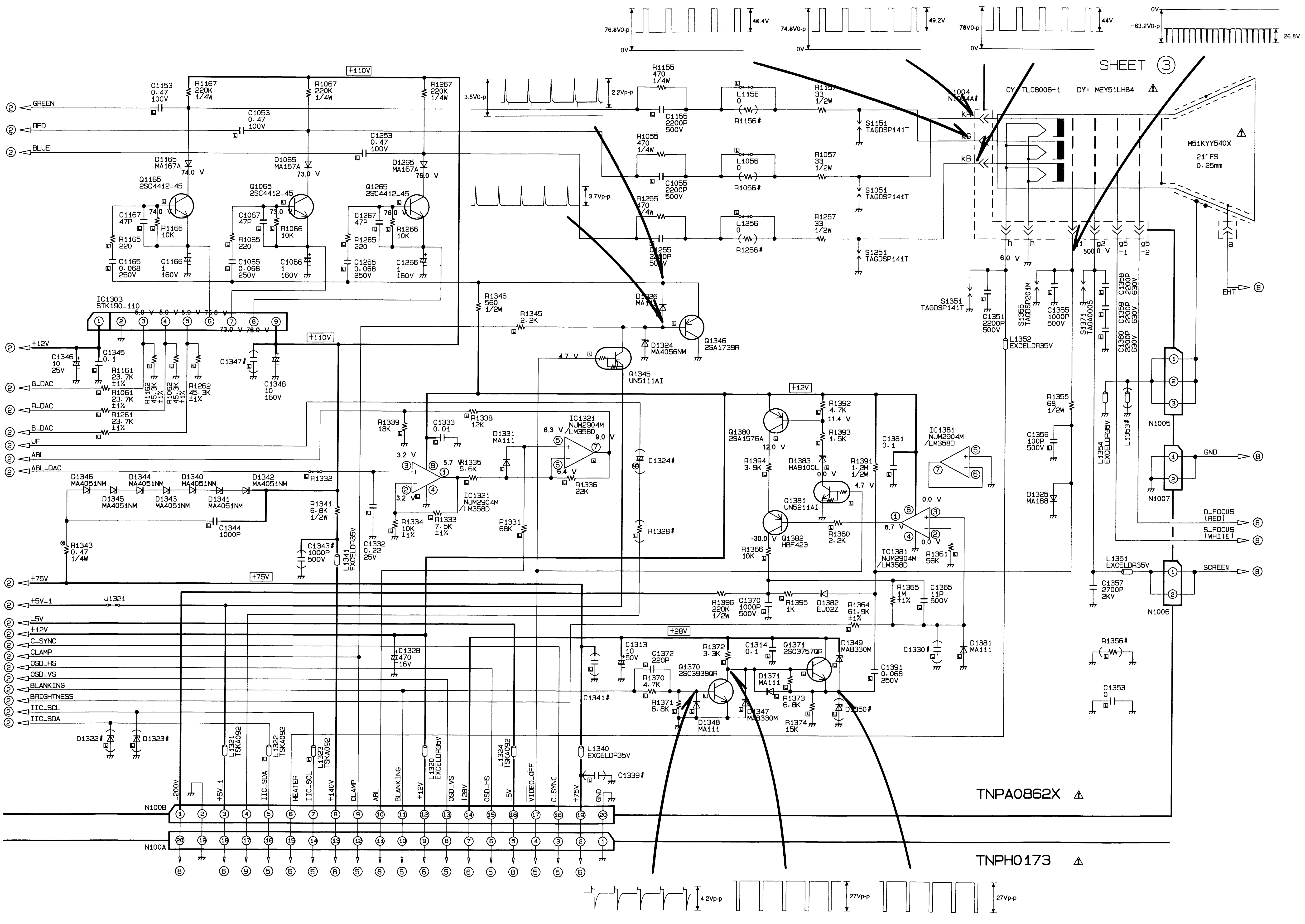
SHEET ①


BNC_RED
BNC_GREEN
BNC_BLUE
BNC_HS
BNC_VS
D_SUB
Access bus
N1001
N1101
N1201
N231
N232
N1011
N1002A RED ②
N1102A GREEN ②
N1202A BLUE ②
+11.3V
+5V
RED
GREEN
BLUE
HS
VS/VCLK
J1302
J1301
AB_SCL
SENSE
AB_SDA
N130# (A-71505-0004) TJSF07504
Q1001 2SC4270
Q1101 2SC4270
Q1201 2SC4270
Q1002 2SC4270
Q1102 2SC4270
Q1202 2SC4270
Q1301 2SA1576A
Q1302 2SA1576A
Q1303 UN5211AI
Q1304 UN5211AI
D1301 MA142WA
D1302 MA142WA
IC1331 MM74HCT00M
IC1501 24LC21T/SN
N.C
N.C
N.C
Vss
Vcc
VCLK
SCL
SDA
VCC
GND
5.0Vp-p
5.0Vp-p
0.7Vp-p
0.7Vp-p
3.2V0-p
0.7Vp-p
2.5V0-p
4.6Vp-p
5.0Vp-p
VCLK
+11.3V
HS
(IIC_SCL)
VS
(IIC_SDA)
SIG_SEL
AB_SDA
SENSE
+5V_1
AB_SCL
N150B
N150A
TNPA0862Y ⚠
TNPH0173 ⚠

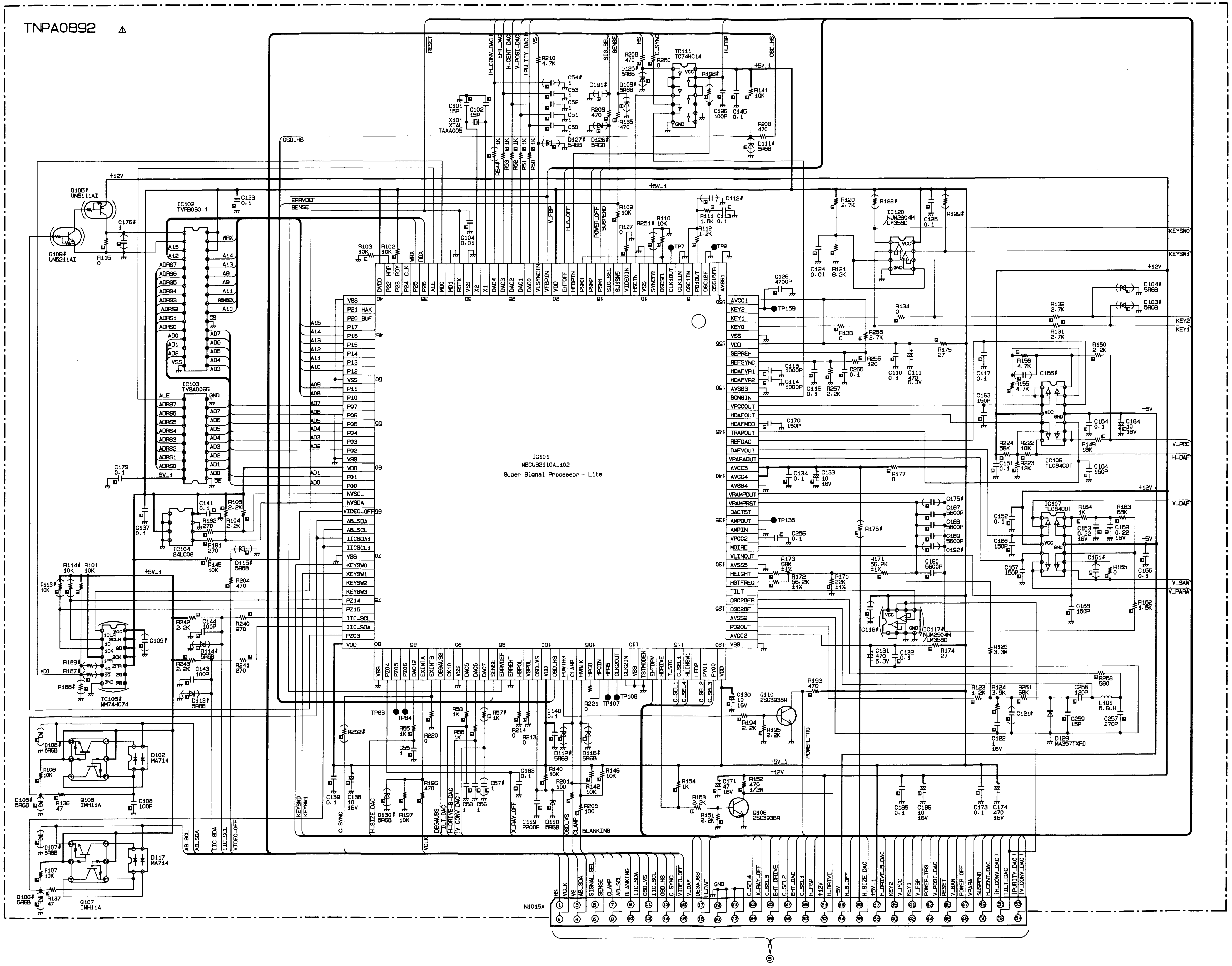
SHEET ②


IC1301
M52741SP700
SELECT
G-IN
VCC
G-OSD
GND
R-IN
SOG IN
B-IN
R-OSD
B-OSD
ABL
NC
VCC (5V)
SOG OUT
G-OUT
G-F/B
R-OUT
R-F/B
BRIGHT
B-OUT
B-F/B
BLK
R.L.L (DAC)
B.L.L (DAC)
G.L.L (DAC)
ABL (DAC)
SDA
SCL
CLAMP
IC1306
L78M09T
J1326
J1325
IC1302
VP3628
IC1305
TA76431
REF
IC1401
LSC4385DW2EL
LXC4385DW2EL
VSS
R
B
G
FBKG
INT
VFLB
VDD
VSS(A)
VCO
RP
VDD(A)
HFLB
SS
SDA
SCL
PWM
PWM
Q280
2SA1739R
Q1383
2SD1819AQR
Q286
2SC3938QR
Q1130
2SC4270
Q1131
2SC4270
Q1132
2SA1764
D1130
DCC010
Q1030
2SC4270
Q1031
2SC4270
Q1032
2SA1764
D1030
DCC010
Q1230
2SC4270
Q1231
2SC4270
Q1232
2SA1764
D1230
DCC010
D1151
MA2Z001
D1152
MA2Z001
D1051
MA2Z001
D1052
MA2Z001
D1251
MA2Z001
D1252
MA2Z001
N1002B
N1102B
N1202B
R
G
B
+12V
+9V
+5V
+5V
+75V
-2.2V
-5V
+75V
GREEN
RED
BLUE
-5V
OSD_HS
BRIGHTNESS
+5V_1
BLANKING
ABL
UF
OSD_VS
C_SYNC
CLAMP
IIC_SCL
G_DAC
IIC_SDA
R_DAC
+12V
B_DAC
ABL_DAC
3.0V0-p
0.6V
4.8V0-p
3.0V
0.7Vp-p
4.0V0-p
2.9Vp-p
4.8V0-p
3.0Vp-p
5.0Vp-p
5.0Vp-p
5.0Vp-p
4.9Vp-p
4.9Vp-p
1.9V0-p
0.8V
68.4V0-p
46.4V

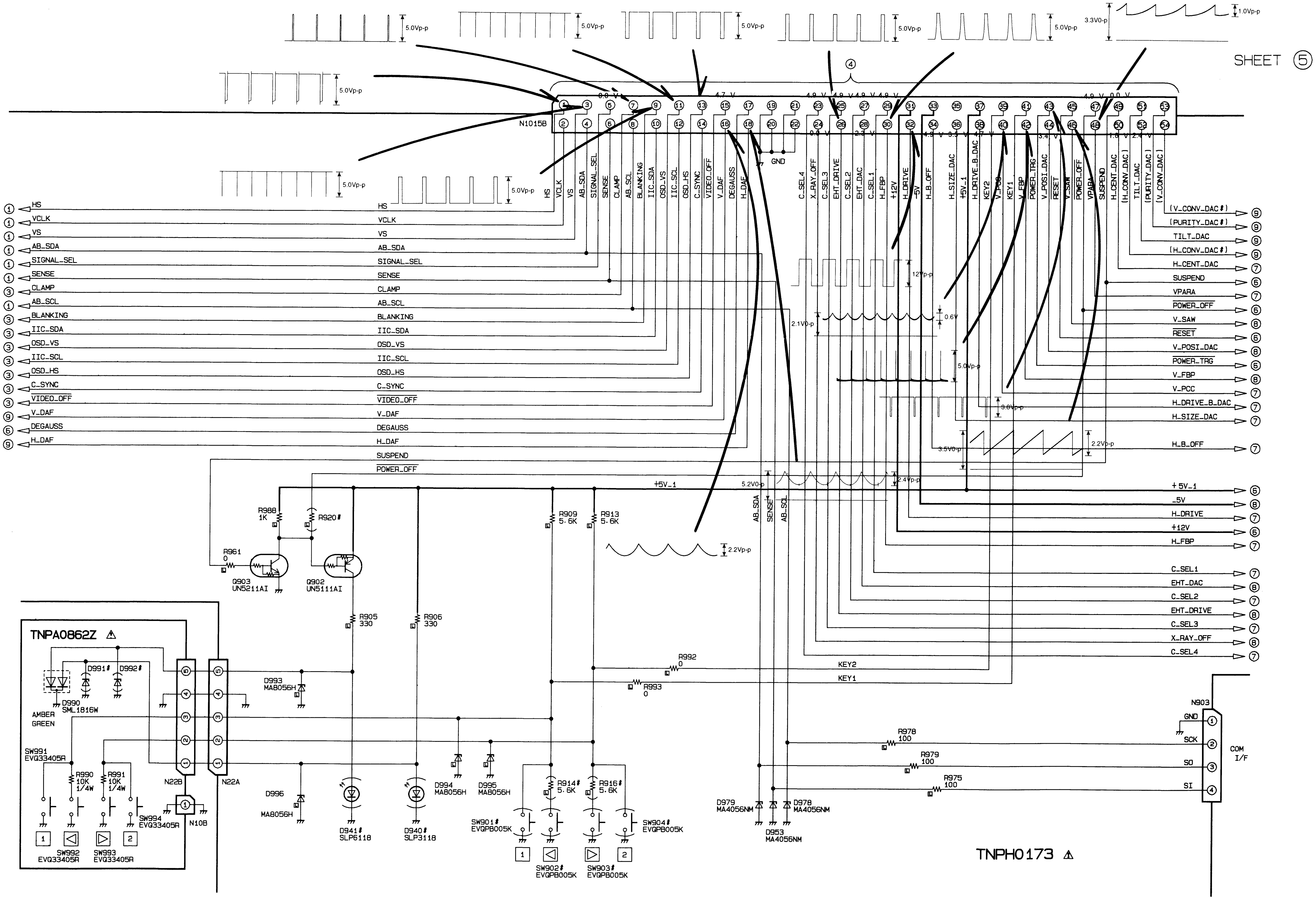
TNPA0862X ⚠

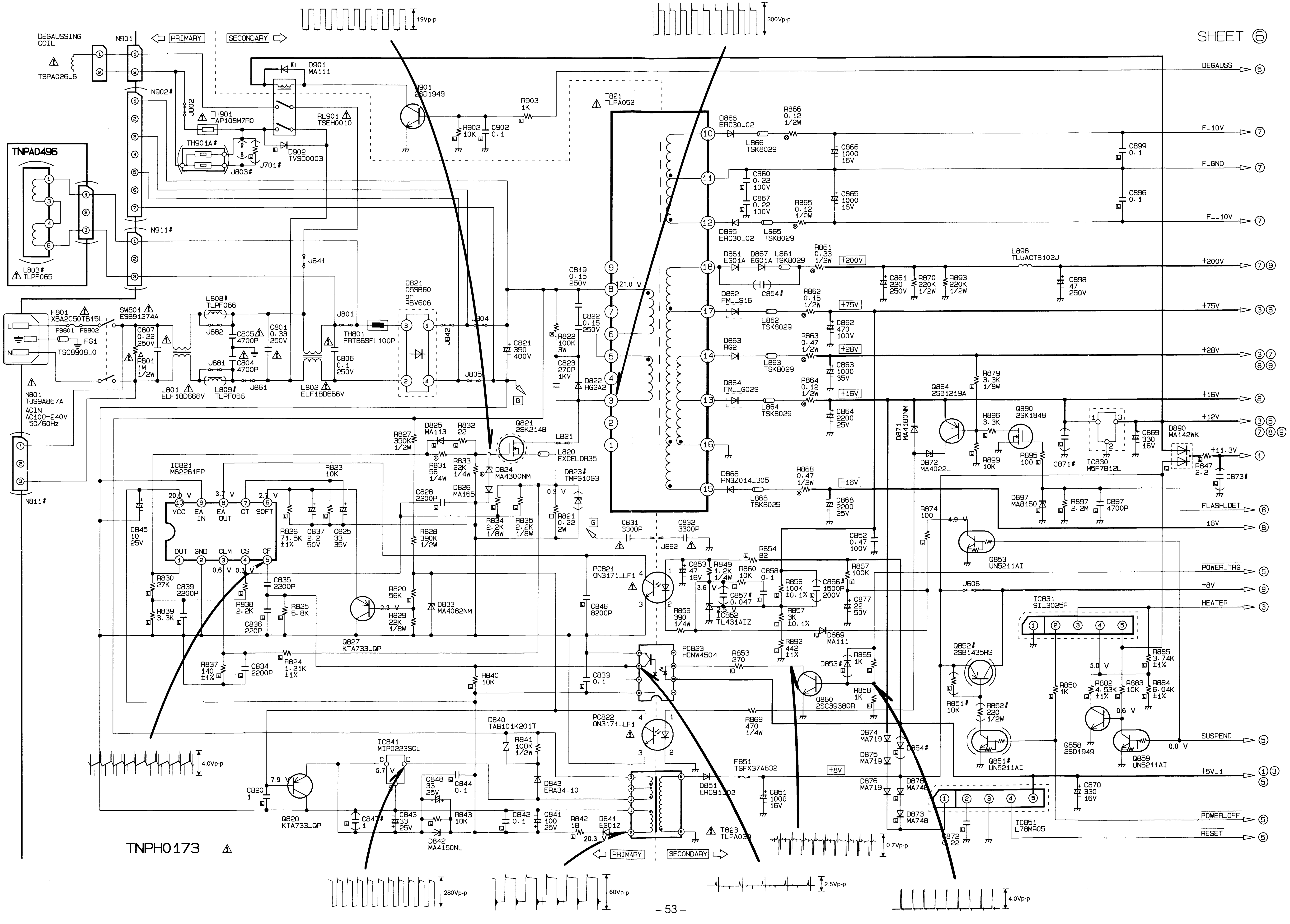

SHEET ③
CY: TLC8006-1
DY: MEY51LHB4
M51KYY540X
21"FS
0.25mm
TNPA0862X
TNPH0173
GREEN
RED
BLUE
+110V
C1153 0.47 100V
R1167 220K 1/4W
R1067 220K 1/4W
R1267 220K 1/4W
C1053 0.47 100V
C1253 0.47 100V
D1165 MA167A
D1065 MA167A
D1265 MA167A
Q1165 2SC4412-45
Q1065 2SC4412-45
Q1265 2SC4412-45
IC1303 STK190-110
+12V
G-DAC
R-DAC
B-DAC
UF
ABL
ABL-DAC
+75V
+5V-1
J1321
-5V
C-SYNC
CLAMP
OSD-HS
OSD-VS
BLANKING
BRIGHTNESS
IIC-SCL
IIC-SDA
R1155 470 1/4W
R1055 470 1/4W
R1255 470 1/4W
L1156 0
L1056 0
L1256 0
R1157 33 1/2W
R1057 33 1/2W
R1257 33 1/2W
S1151 TAGDSP141T
S1051 TAGDSP141T
S1251 TAGDSP141T
N1004
Q1346 2SA1739A
D1324 MA4056NM
Q1345 UN5111AI
IC1321 NJM2904M /LM358D
IC1381 NJM2904M /LM358D
Q1380 2SA1576A
Q1381 UN5211AI
Q1382 HBF423
Q1370 2SC3938QR
Q1371 2SC3757QR
+28V
D1349 MA8330M
D1381 MA111
S1351 TAGDSP141T
S1355 TAGDSP201M
S1371 TAGA0005
C1351 2200P 500V
C1355 1000P 500V
L1352 EXCELDR35V
R1355 68 1/2W
N1005
N1007
N1006
GND
D-FOCUS (RED)
S-FOCUS (WHITE)
SCREEN
EHT
L1351 EXCELDR35V
C1357 2700P 2KV
N100B
N100A
-200V
+5V-1
IIC-SDA
HEATER
IIC-SCL
+140V
CLAMP
ABL
BLANKING
+12V
OSD-VS
+28V
OSD-HS
-5V
VIDEO-OFF
C-SYNC
+75V
GND
L1340 EXCELDR35V
L1320 EXCELDR35V
L1321 TSKA092
L1322 TSKA092
L1323 TSKA092
L1324 TSKA092
76.8V0-p
46.4V
74.8V0-p
49.2V
78V0-p
44V
63.2V0-p
26.8V
3.5V0-p
2.2Vp-p
3.7Vp-p
4.2Vp-p
27Vp-p
27Vp-p

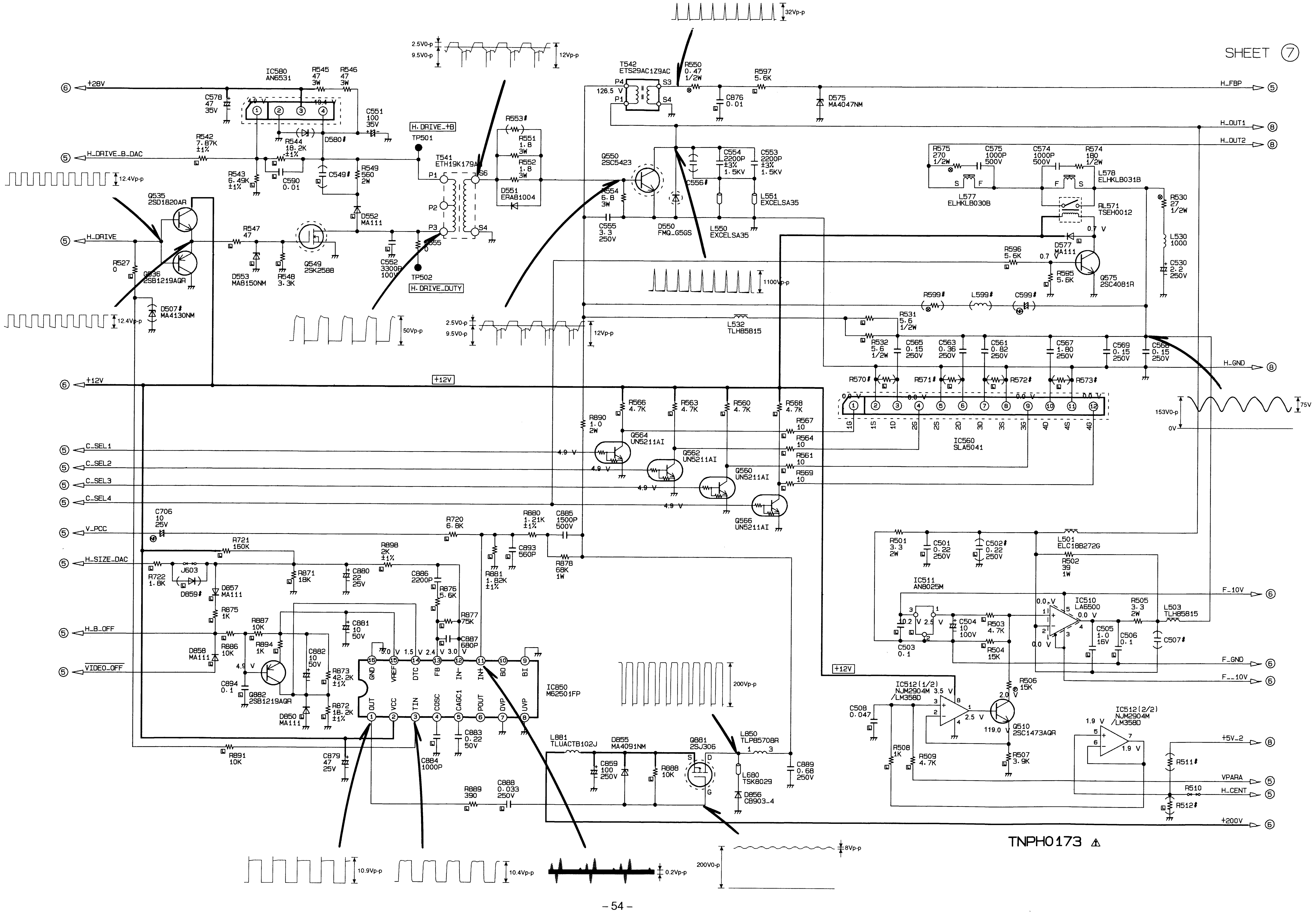
SHEET ④


TNPA0892 ⚠
IC101
MBCU32110A_102
Super Signal Processor - Lite
IC102
TVR8030_1
IC103
TVSA0066
IC104
24LC08
IC105
MM74HC74
IC106
TL084CDT
IC107
TL084CDT
IC111
TC74HC14
IC120
NJM2904M
/LM358D
IC117
NJM2904M
/LM358D
Q105
UN5111AI
Q109
UN5211AI
Q110
2SC3938R
Q106
2SC3938R
Q108
IMH11A
Q107
IMH11A
D102
MA714
D117
MA714
D129
MA357TXFD
X101
XTAL
TAAA005
L101
5.6uH
+12V
+5V_1
-5V
OSD_HS
ERRVDEF
SENSE
KEYSW0
KEYSW1
KEY2
KEY1
V_PCC
H_DAF
V_DAF
V_SAW
V_PARA
TP159
TP135
TP7
TP2
TP83
TP84
TP107
TP108
N1015A
HS
VCLK
VS
AB_SDA
SIGNAL_SEL
SENSE
CLAMP
AB_SCL
BLANKING
IIC_SDA
OSD_VS
IIC_SCL
OSD_HS
C_SYNC
VIDEO_OFF
DEGAUSS
H_DAF
GND
C_SEL4
X_RAY_OFF
C_SEL3
EHT_DRIVE
C_SEL2
EHT_DAC
C_SEL1
H_FBP
+12V
H_DRIVE
-5V
H_B_OFF
H_SIZE_DAC
H5V_1
H_DRIVE_B_DAC
KEY2
V_PCC
KEY1
V_FBP
POWER_TRG
V_POSI_DAC
RESET
V_SAW
POWER_OFF
VPARA
SUSPEND
H_CENT_DAC
TILT_DAC
(PULITY_DAC)
(V_CONV_DAC)
⑤

SHEET ⑤


5.0Vp-p
3.3V0-p
1.0Vp-p
12Vp-p
2.1V0-p
0.6V
3.0Vp-p
3.5V0-p
2.2Vp-p
5.2V0-p
2.4Vp-p
N1015B
GND
HS
VCLK
VS
AB_SDA
SIGNAL_SEL
SENSE
CLAMP
AB_SCL
BLANKING
IIC_SDA
OSD_VS
IIC_SCL
OSD_HS
C_SYNC
VIDEO_OFF
V_DAF
DEGAUSS
H_DAF
SUSPEND
POWER_OFF
C_SEL4
X_RAY_OFF
C_SEL3
EHT_DRIVE
C_SEL2
EHT_DAC
C_SEL1
H_FBP
+12V
H_DRIVE
-5V
H_B_OFF
H_SIZE_DAC
+5V_1
H_DRIVE_B_DAC
KEY2
V_PCC
KEY1
V_FBP
POWER_TRG
V_POSI_DAC
RESET
V_SAW
VPARA
H_CENT_DAC
(H_CONV_DAC#)
TILT_DAC
(PURITY_DAC#)
(V_CONV_DAC#)
R988 1K
R920#
R961 0
Q903 UN5211AI
Q902 UN5111AI
R909 5.6K
R913 5.6K
R905 330
R906 330
R992 0
R993 0
AB_SDA
SENSE
AB_SCL
TNPA0862Z ⚠
D991#
D992#
D990 SML1816W
AMBER
GREEN
SW991 EVQ33405R
R990 10K 1/4W
R991 10K 1/4W
SW994 EVQ33405R
SW992 EVQ33405R
SW993 EVQ33405R
N22B
N22A
N10B
D993 MA8056H
D996 MA8056H
D941# SLP6118
D940# SLP3118
D994 MA8056H
D995 MA8056H
R914# 5.6K
R916# 5.6K
SW901# EVQPB005K
SW902# EVQPB005K
SW903# EVQPB005K
SW904# EVQPB005K
D979 MA4056NM
D978 MA4056NM
D953 MA4056NM
R978 100
R979 100
R975 100
N903
GND
SCK
SO
SI
COM I/F
TNPH0173 ⚠

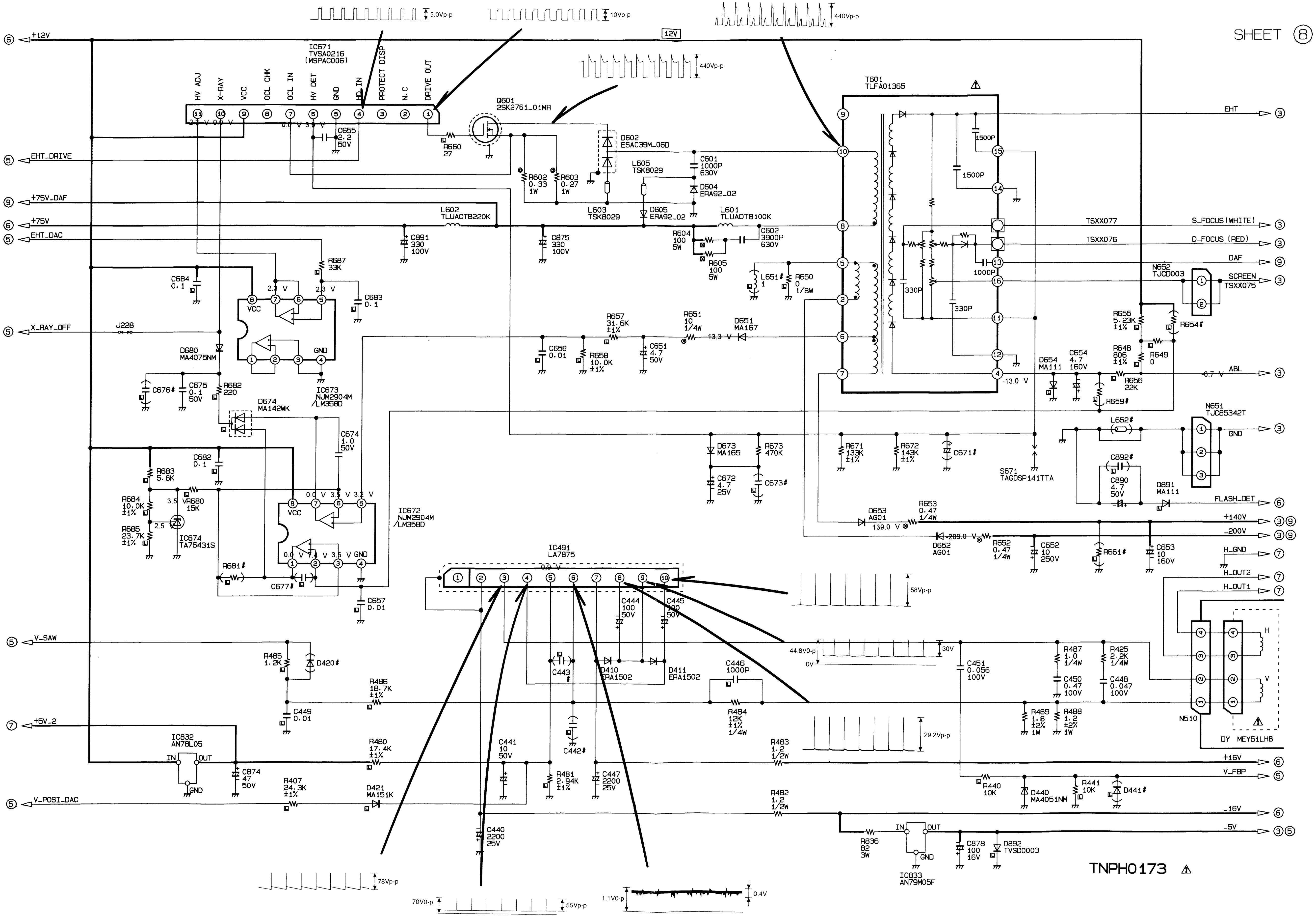

DEGAUSSING COIL
TSPA026_6
N901
PRIMARY
SECONDARY
19Vp-p
300Vp-p
D901 MA111
Q901 2SD1949
R902 10K
C902 0.1
R903 1K
T821 TLPA052
N902
J802
TH901 TAP108M7R0
TH901A
J803
J701
RL901 TSEH0010
D902 TVSD0003
TNPA0496
L803 TLPF065
N911
F801 XBA2C50TB15L
FS801
FS802
FG1
TSC8908_0
SW801 ESB91274A
C807 0.22 250V
R801 1M 1/2W
L808 TLPF066
J882
C805 4700P
C801 0.33 250V
J881
C804 4700P
L801 ELF18D666V
L809 TLPF066
J861
L802 ELF18D666V
C806 0.1 250V
J801
TH801 ERTB6SFL100P
J841
D821 D5SB60 or RBV606
J842
J804
J805
C821 390 400V
C819 0.15 250V
C822 0.15 250V
R822 100K 3W
C823 270P 1KV
D822 RG2A2
121.0 V
N801 TJS9A867A
ACIN AC100-240V 50/60Hz
N811
D866 ERC30_02
L866 TSK8029
R866 0.12 1/2W
C866 1000 16V
C860 0.22 100V
C867 0.22 100V
R865 0.12 1/2W
C865 1000 16V
D865 ERC30_02
L865 TSK8029
C899 0.1
C896 0.1
F_10V
F_GND
F_-10V
DEGAUSS
D861 EG01A
D867 EG01A
L861 TSK8029
R861 0.33 1/2W
+200V
C854
C861 220 250V
R870 220K 1/2W
R893 220K 1/2W
L898 TLUACTB102J
C898 47 250V
D862 FML_S16
R862 0.15 1/2W
+75V
L862 TSK8029
C862 470 100V
D863 RG2
R863 0.47 1/2W
+28V
L863 TSK8029
C863 1000 35V
D864 FML_G02S
R864 0.12 1/2W
+16V
L864 TSK8029
C864 2200 25V
D868 RN3Z014_305
R868 0.47 1/2W
-16V
L868 TSK8029
C868 2200 25V
D871 MA4180NM
Q864 2SB1219A
R879 3.3K 1/8W
R896 3.3K
R899 10K
Q890 2SK1848
R895 100
D872 MA4022L
C871
IC830 M5F7812L
C859 330 16V
D890 MA142WK
+11.3V
R847 2.2
C873
+12V
D897 MA8150
R897 2.2M
C897 4700P
FLASH_DET
-16V
R874 100
4.9 V
Q853 UN5211AI
POWER_TRG
J608
+8V
HEATER
IC831 SI_3025F
Q852 2SB1435RS
R885 3.74K ±1%
R850 1K
5.0 V
R882 4.53K ±1%
R883 10K
R884 6.04K ±1%
0.6 V
R851 10K
R852 220 1/2W
Q851 UN5211AI
Q858 2SD1949
Q859 UN5211AI
0.0 V
SUSPEND
+5V_1
C870 330 16V
IC851 L78MR05
C872 0.22
POWER_OFF
RESET
Q821 2SK2148
R827 390K 1/2W
D825 MA113
R832 22
R831 56 1/4W
R833 22K 1/4W
D824 MA4300NM
D826 MA165
L821
L820 EXCELDR35
D823 TMPG10G3
0.3 V
R821 0.22 2W
R834 2.2K 1/8W
R835 2.2K 1/8W
C828 2200P
IC821 M62281FP
R823 10K
20.0 V
3.7 V
2.7 V
VCC
EA IN
EA OUT
CT
SOFT
OUT
GND
CLM
CS
CF
0.6 V
0.3 V
C845 10 25V
R826 71.5K ±1%
C837 2.2 50V
C825 33 35V
R828 390K 1/2W
C831 3300P
C832 3300P
J862
R830 27K
C839 2200P
R839 3.3K
C835 2200P
R838 2.2K
R825 6.8K
C836 220P
R820 56K
2.3 V
R829 22K 1/8W
D833 MA4082NM
Q827 KTA733_QP
PC821 ON3171_LF1
C846 8200P
R837 140 ±1%
C834 2200P
R824 1.21K ±1%
R840 10K
C833 0.1
PC823 HCNW4504
C853 47 16V
R849 1.2K 1/4W
R860 10K
C858 0.1
R854 82
C852 0.47 100V
R867 100K
R856 100K ±0.1%
C856 1500P 200V
C857 0.047
3.6 V
2.5 V
IC852 TL431AIZ
R859 390 1/4W
R857 3K ±0.1%
C877 22 50V
D869 MA111
R892 442 ±1%
R853 270
D853
R855 1K
Q860 2SC3938QR
R858 1K
R869 470 1/4W
PC822 ON3171_LF1
D874 MA719
D875 MA719
D854
D876 MA719
D878 MA748
D873 MA748
F851 TSFX37A632
+8V
D851 ERC91_02
C851 1000 16V
4.0Vp-p
D840 TAB101K201T
IC841 MIP0223SCL
R841 100K 1/2W
5.7 V
7.9 V
C820 1
Q820 KTA733_QP
C848 33 25V
C844 0.1
C847 1
C843 33 25V
R843 10K
D842 MA4150NL
D843 ERA34_10
C842 0.1
C841 100 25V
R842 18
20.3 V
D841 EG01Z
T823 TLPA030
PRIMARY
SECONDARY
0.7Vp-p
280Vp-p
60Vp-p
2.5Vp-p
4.0Vp-p
TNPH0173


+28V
IC580 AN6531
R545 47 3W
R546 47 3W
C578 47 35V
C551 100 35V
H.DRIVE_+B
TP501
R553
R551 1.8 3W
R552 1.8 3W
T542 ETS29AC1Z9AC
R550 0.47 1/2W
R597 5.6K
H_FBP
C876 0.01
D575 MA4047NM
H_OUT1
H_OUT2
H_DRIVE_B_DAC
R542 7.87K ±1%
R544 18.2K ±1%
D580
R543 6.49K ±1%
C590 0.01
C549
R549 560 2W
T541 ETH19K179AA
D551 ERA81004
Q550 2SC5423
C554 2200P ±3% 1.5KV
C553 2200P ±3% 1.5KV
R575 270 1/2W
C575 1000P 500V
C574 1000P 500V
R574 180 1/2W
L578 ELHKLB031B
L577 ELHKLB030B
RL571 TSEH0012
R530 27 1/2W
L530 1000
C530 2.2 250V
12.4Vp-p
Q535 2SD1820AR
H_DRIVE
R547 47
D552 MA111
C552 3300P 100V
R555
TP502
H.DRIVE_DUTY
Q549 2SK2588
D553 MA8150NM
R548 3.3K
R527 0
Q536 2SB1219AQR
D507 MA4130NM
R554 6.8 3W
C555 3.3 250V
C556
D550 FMQ_G5GS
L550 EXCELSA35
L551 EXCELSA35
R596 5.6K
D577 MA111
Q575 2SC4081R
R595 5.6K
32Vp-p
2.5V0-p
9.5V0-p
12Vp-p
1100Vp-p
50Vp-p
R599
L599
C599
R531 5.6 1/2W
L532 TLH85815
R532 5.6 1/2W
C565 0.15 250V
C563 0.36 250V
C561 0.82 250V
C567 1.80 250V
C569 0.15 250V
C568 0.15 250V
H_GND
+12V
R570
R571
R572
R573
IC560 SLA5041
153V0-p
75V
0V
R566 4.7K
R563 4.7K
R560 4.7K
R568 4.7K
R890 1.0 2W
R567 10
R564 10
R561 10
R569 10
Q564 UN5211AI
Q562 UN5211AI
Q560 UN5211AI
Q566 UN5211AI
C_SEL1
C_SEL2
C_SEL3
C_SEL4
4.9 V
C706 10 25V
V_PCC
R720 6.8K
R880 1.21K ±1%
C885 1500P 500V
R721 160K
H_SIZE_DAC
R898 2K ±1%
C893 560P
R881 1.82K ±1%
R878 68K 1W
R722 1.8K
J603
D859
D857 MA111
R871 18K
C880 22 25V
C886 2200P
R876 5.6K
R877 75K
C887 680P
R875 1K
H_B_OFF
R887 10K
C881 10 50V
R894 1K
D858 MA111
R886 10K
C882 10 50V
R873 42.2K ±1%
R872 18.2K ±1%
VIDEO_OFF
C894 0.1
Q882 2SB1219AQR
D850 MA111
IC850 M62501FP
GND VREF DTC FB IN- IN+ BO BI
OUT VCC TIN COSC CAGC1 POUT OVP UVP
C883 0.22 50V
C884 1000P
R891 10K
C879 47 25V
R889 390
C888 0.033 250V
200Vp-p
L881 TLUACTB102J
D855 MA4091NM
C859 100 250V
R888 10K
Q881 2SJ306
L850 TLP85708R
L680 TSK8029
D856 CB903_4
C889 0.68 250V
R501 3.3 2W
C501 0.22 250V
C502 0.22 250V
L501 ELC18B272G
R502 39 1W
IC511 AN8025M
IC510 LA6500
R505 3.3 2W
L503 TLH85815
F_10V
C504 10 100V
R503 4.7K
C505 1.0 16V
C506 0.1
C507
C503 0.1
R504 15K
F_GND
F_-10V
IC512(1/2) NJM2904M /LM358D
R506 15K
Q510 2SC1473AQR
C508 0.047
R508 1K
R509 4.7K
R507 3.9K
IC512(2/2) NJM2904M /LM358D
+5V_2
R511
VPARA
R510
H_CENT
R512
+200V
10.9Vp-p
10.4Vp-p
0.2Vp-p
200V0-p
8Vp-p

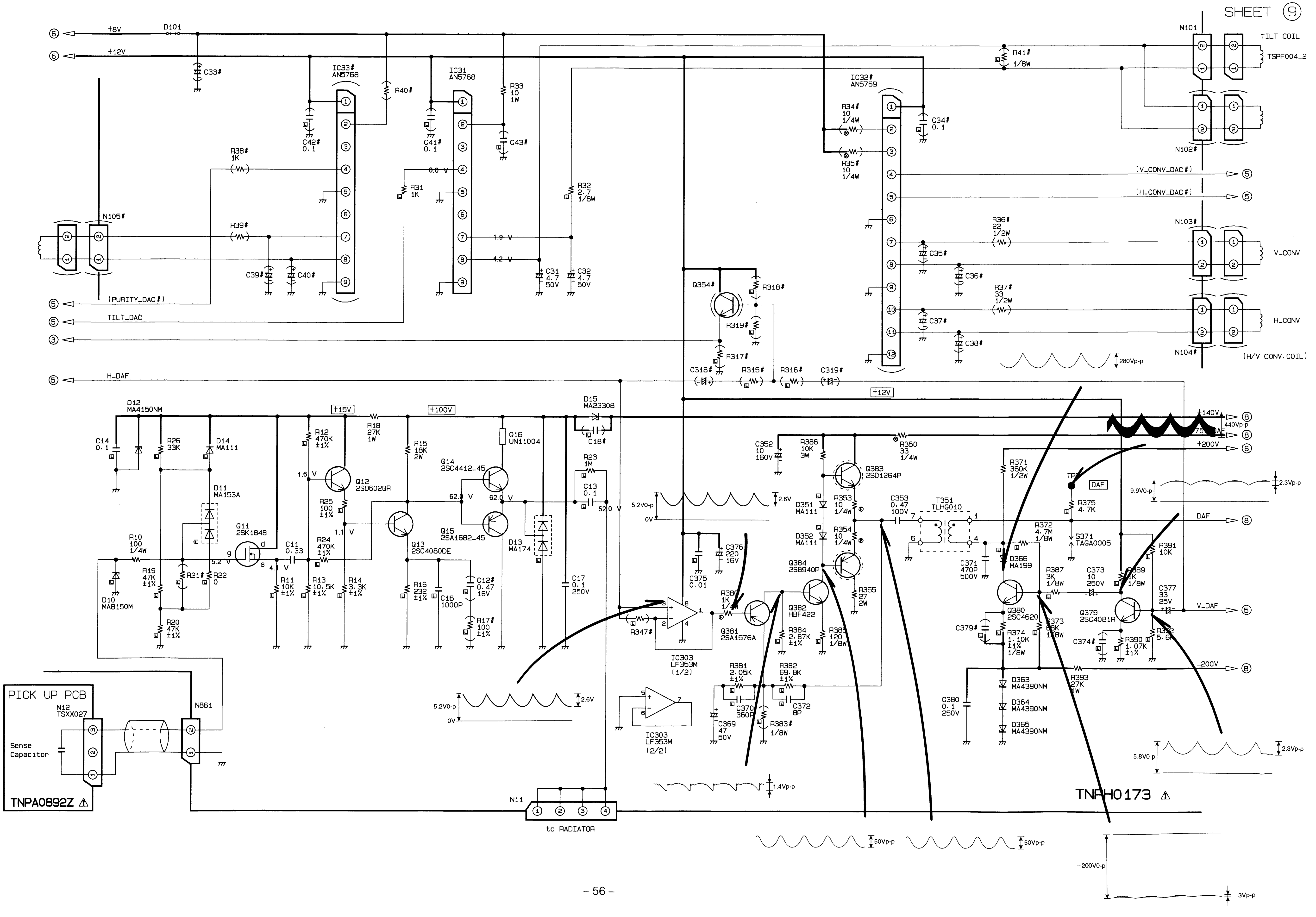
SHEET ⑦

TNPH0173 ⚠

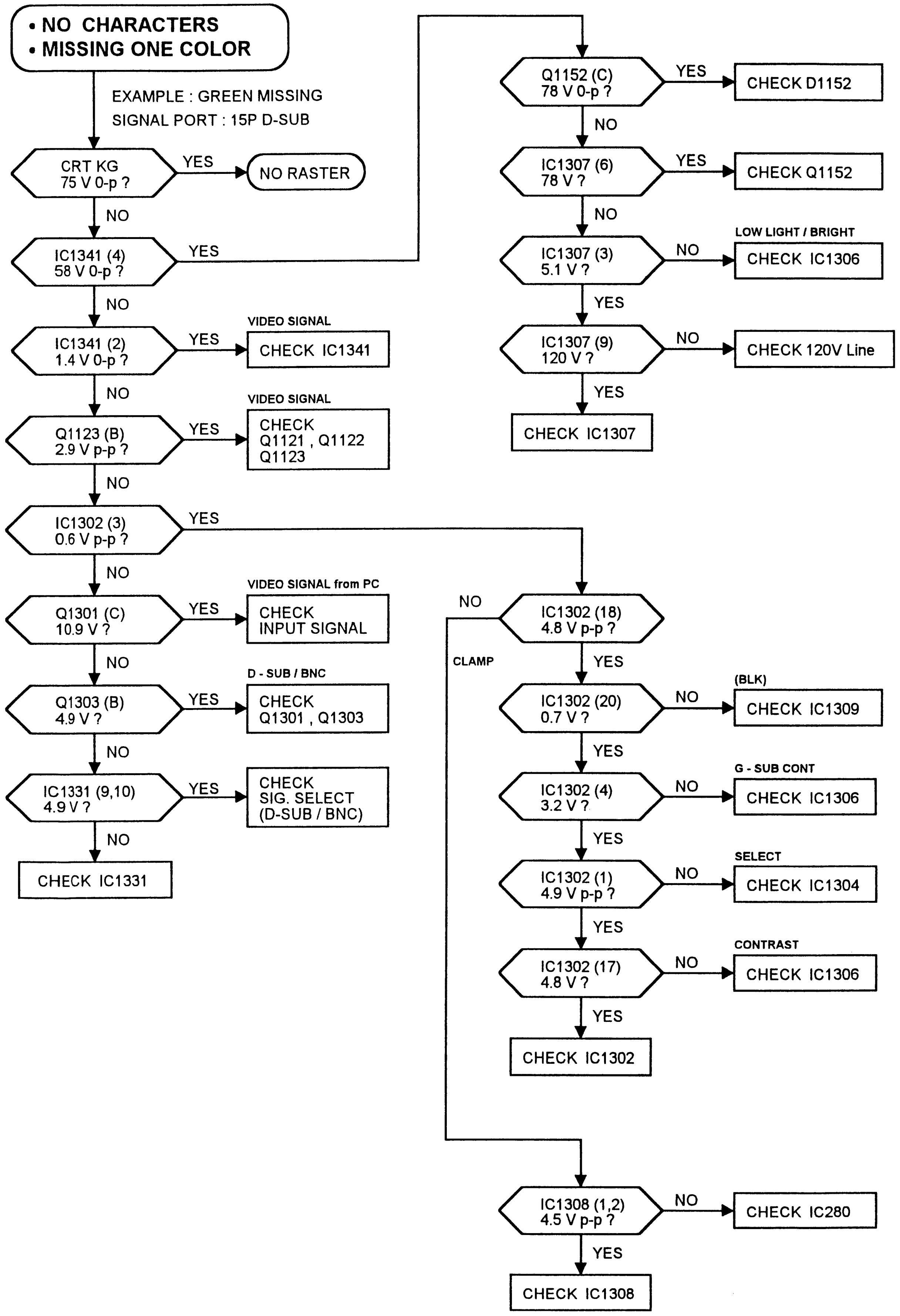
SHEET ⑧

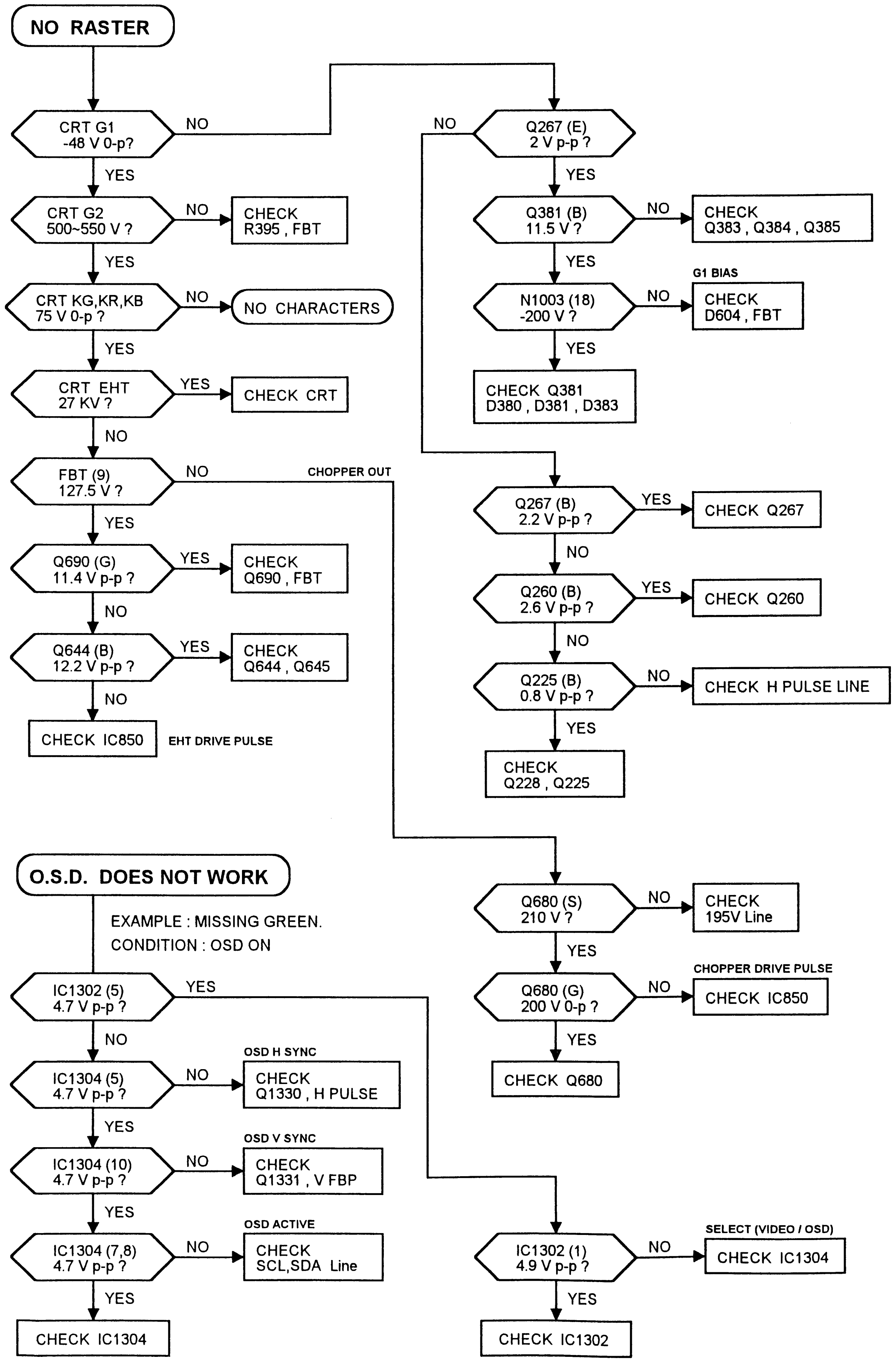


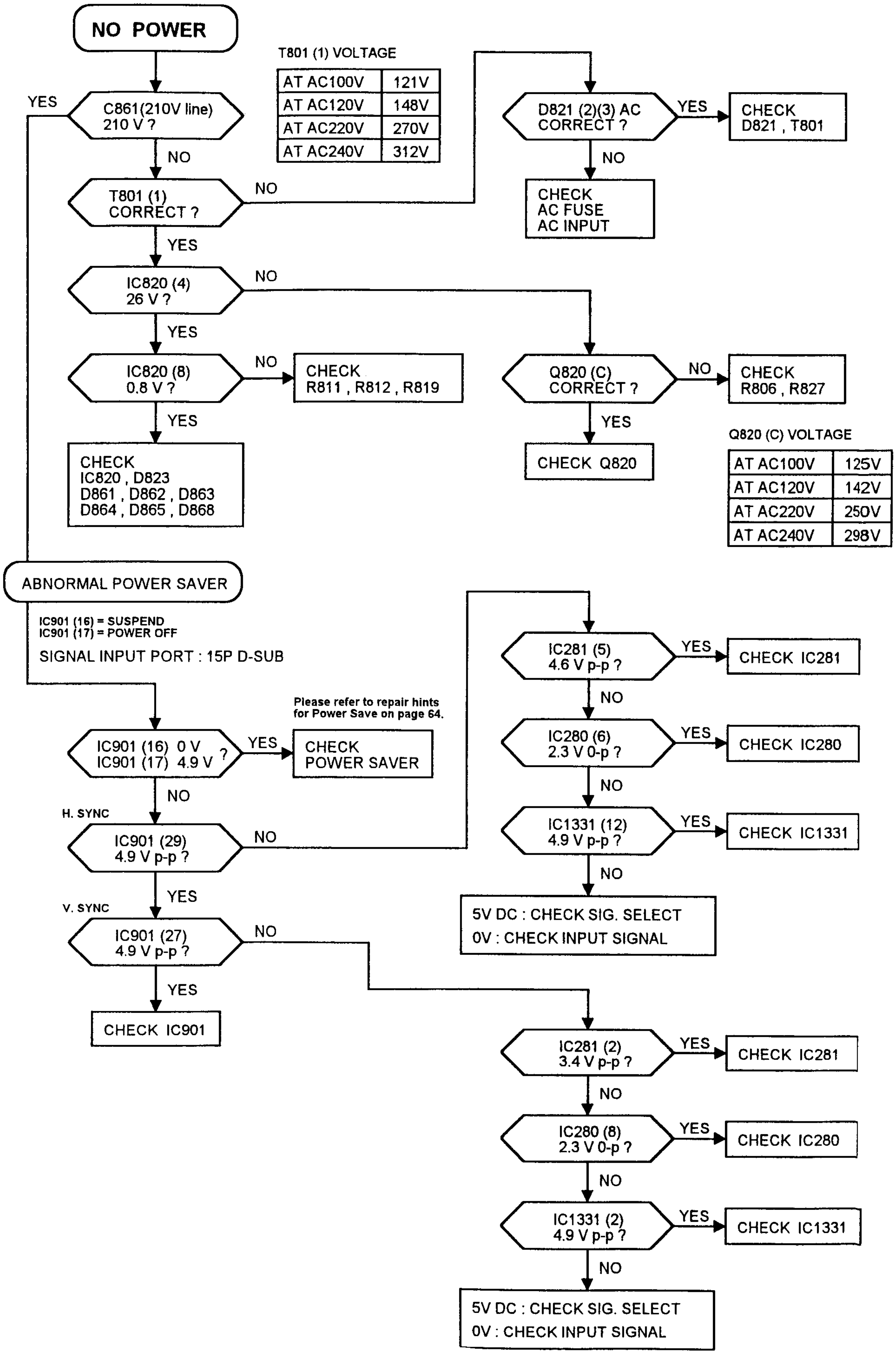
⑥ +12V
⑤ EHT_DRIVE
⑨ +75V_DAF
⑥ +75V
⑤ EHT_DAC
⑤ X_RAY_OFF
J228
⑤ V_SAW
⑦ +5V_2
⑤ V_POSI_DAC
5.0Vp-p
10Vp-p
440Vp-p
440Vp-p
12V
IC671
TVSA0216
(MSPAC006)
HV ADJ
X-RAY
VCC
OCL CHK
OCL IN
HV DET
GND
HD IN
PROTECT DISP
N.C
DRIVE OUT
C655
2.2
50V
Q601
2SK2761-01MR
R660
27
D602
ESAC39M-06D
R602
0.33
1W
R603
0.27
1W
L605
TSK8029
C601
1000P
630V
D604
ERA92-02
L603
TSK8029
D605
ERA92-02
L601
TLUADTB100K
L602
TLUACTB220K
C891
330
100V
C875
330
100V
R604
100
5W
R605
100
5W
C602
3900P
630V
R687
33K
C684
0.1
C683
0.1
VCC
GND
D680
MA4075NM
C676
C675
0.1
50V
R682
220
IC673
NJM2904M
/LM358D
D674
MA142WK
C674
1.0
50V
R657
31.6K
±1%
C656
0.01
R658
10.0K
±1%
C651
4.7
50V
R651
10
1/4W
D651
MA167
13.3 V
L651
1
R650
0
1/8W
C682
0.1
R683
5.6K
R684
10.0K
±1%
VR680
15K
R685
23.7K
±1%
IC674
TA76431S
R681
C677
C657
0.01
IC672
NJM2904M
/LM358D
D673
MA165
R673
470K
C672
4.7
25V
C673
R671
133K
±1%
R672
143K
±1%
C671
S671
TAGDSP141TTA
T601
TLFA01365
1500P
1500P
1000P
330P
330P
-13.0 V
EHT ③
TSXX077
S_FOCUS (WHITE) ③
TSXX076
D_FOCUS (RED) ③
DAF ⑨
N652
TJCD003
SCREEN
TSXX075 ③
R655
5.23K
±1%
R654
R648
806
±1%
R649
0
D654
MA111
C654
4.7
160V
R656
22K
R659
-6.7 V
ABL ③
N651
TJC85342T
GND ③
L652
C892
C890
4.7
50V
D891
MA111
FLASH_DET ⑥
D653
AG01
139.0 V
R653
0.47
1/4W
+140V ③⑨
D652
AG01
-209.0 V
R652
0.47
1/4W
-200V ③⑨
C652
10
250V
R661
C653
10
160V
H_GND ⑦
H_OUT2 ⑦
H_OUT1 ⑦
IC491
LA7875
0.9 V
58Vp-p
C444
100
50V
C445
100
50V
44.8V0-p
0V
30V
R485
1.2K
D420
C443
D410
ERA1502
D411
ERA1502
C446
1000P
R486
18.7K
±1%
C449
0.01
R484
12K
±1%
1/4W
C451
0.056
100V
R487
1.0
1/4W
R425
2.2K
1/4W
C450
0.47
100V
C448
0.047
100V
R489
1.8
±2%
1W
R488
1.2
±2%
1W
N510
H
V
DY MEY51LHB
29.2Vp-p
IC832
AN78L05
IN
OUT
GND
C874
47
50V
R480
17.4K
±1%
C441
10
50V
C442
R481
2.94K
±1%
C447
2200
25V
R483
1.2
1/2W
+16V ⑥
V_FBP ⑤
R407
24.3K
±1%
D421
MA151K
R440
10K
D440
MA4051NM
R441
10K
D441
R482
1.2
1/2W
-16V ⑥
C440
2200
25V
IN
OUT
GND
R836
82
3W
C878
100
16V
D892
TVSD0003
IC833
AN79M05F
-5V ③⑤
78Vp-p
70V0-p
55Vp-p
1.1V0-p
0.4V
TNPH0173


SHEET ⑨
+8V
D101
+12V
C33#
IC33#
AN5768
R40#
IC31
AN5768
R33
10
1W
C43#
C42#
0.1
C41#
0.1
R38#
1K
R31
1K
0.0 V
R39#
N105#
C39#
C40#
1.9 V
4.2 V
C31
4.7
50V
C32
4.7
50V
R32
2.7
1/8W
(PURITY_DAC#)
TILT_DAC
H_DAF
IC32#
AN5769
C34#
0.1
R34#
10
1/4W
R35#
10
1/4W
R41#
1/8W
N101
TILT COIL
TSPF004_2
N102#
(V_CONV_DAC#)
(H_CONV_DAC#)
N103#
R36#
22
1/2W
C35#
C36#
V_CONV
R37#
33
1/2W
C37#
C38#
H_CONV
N104#
(H/V CONV. COIL)
280Vp-p
Q354#
R318#
R319#
R317#
C318#
R315#
R316#
C319#
+12V
D12
MA4150NM
+15V
+100V
R18
27K
1W
D15
MA2330B
C18#
C14
0.1
R26
33K
D14
MA111
R12
470K
±1%
R15
18K
2W
Q16
UN11004
Q14
2SC4412_45
R23
1M
C13
0.1
52.0 V
1.6 V
Q12
2SD602QR
R25
100
±1%
D11
MA153A
62.0 V
62.0 V
1.1 V
Q13
2SC4080DE
Q15
2SA1682_45
D13
MA174
Q11
2SK1848
g
d
s
R10
100
1/4W
5.2 V
4.1 V
C11
0.33
R24
470K
±1%
R19
47K
±1%
R21#
R22
0
R11
10K
±1%
R13
10.5K
±1%
R14
3.3K
±1%
R16
232
±1%
C16
1000P
C12#
0.47
16V
R17#
100
±1%
C17
0.1
250V
D10
MA8150M
R20
47K
±1%
PICK UP PCB
N12
TSXX027
Sense Capacitor
N861
TNPA0892Z ⚠
5.2V0-p
0V
2.6V
N11
to RADIATOR
C352
10
160V
R386
10K
3W
R350
33
1/4W
Q383
2SD1264P
+140V
440Vp-p
+200V
75
DAF
5.2V0-p
0V
2.6V
D351
MA111
R353
10
1/4W
C353
0.47
100V
T351
TLH6010
D352
MA111
R354
10
1/4W
C376
220
16V
C375
0.01
Q384
2SB940P
R355
27
2W
Q382
HBF422
R380
1K
1/4W
R347#
IC303
LF353M
(1/2)
Q381
2SA1576A
R384
2.87K
±1%
R385
120
1/8W
R381
2.05K
±1%
R382
69.8K
±1%
C370
360P
C372
8P
C369
47
50V
R383#
1/8W
IC303
LF353M
(2/2)
1.4Vp-p
R371
360K
1/2W
TP
DAF
9.9V0-p
2.3Vp-p
R375
4.7K
S371
TAGA0005
R372
4.7M
1/8W
D366
MA199
C371
470P
500V
R391
10K
R387
3K
1/8W
C373
10
250V
R389
1K
1/8W
C377
33
25V
Q380
2SC4620
Q379
2SC4081R
V_DAF
C379#
R374
1.10K
±1%
1/8W
R373
68K
1/8W
C374#
R390
1.07K
±1%
R392
5.6
-200V
D363
MA4390NM
R393
27K
1W
C380
0.1
250V
D364
MA4390NM
D365
MA4390NM
5.8V0-p
2.3Vp-p
TNPH0173 ⚠
50Vp-p
50Vp-p
200V0-p
3Vp-p

TROUBLE SHOOTING HINTS


• NO CHARACTERS
• MISSING ONE COLOR
EXAMPLE : GREEN MISSING
SIGNAL PORT : 15P D-SUB
CRT KG 75 V 0-p ?
YES
NO RASTER
NO
IC1341 (4) 58 V 0-p ?
YES
NO
IC1341 (2) 1.4 V 0-p ?
YES
VIDEO SIGNAL
CHECK IC1341
NO
Q1123 (B) 2.9 V p-p ?
YES
VIDEO SIGNAL
CHECK Q1121 , Q1122 Q1123
NO
IC1302 (3) 0.6 V p-p ?
YES
NO
Q1301 (C) 10.9 V ?
YES
VIDEO SIGNAL from PC
CHECK INPUT SIGNAL
NO
Q1303 (B) 4.9 V ?
YES
D - SUB / BNC
CHECK Q1301 , Q1303
NO
IC1331 (9,10) 4.9 V ?
YES
CHECK SIG. SELECT (D-SUB / BNC)
NO
CHECK IC1331
Q1152 (C) 78 V 0-p ?
YES
CHECK D1152
NO
IC1307 (6) 78 V ?
YES
CHECK Q1152
NO
IC1307 (3) 5.1 V ?
NO
LOW LIGHT / BRIGHT
CHECK IC1306
YES
IC1307 (9) 120 V ?
NO
CHECK 120V Line
YES
CHECK IC1307
NO
CLAMP
IC1302 (18) 4.8 V p-p ?
YES
IC1302 (20) 0.7 V ?
NO
(BLK)
CHECK IC1309
YES
IC1302 (4) 3.2 V ?
NO
G - SUB CONT
CHECK IC1306
YES
IC1302 (1) 4.9 V p-p ?
NO
SELECT
CHECK IC1304
YES
IC1302 (17) 4.8 V ?
NO
CONTRAST
CHECK IC1306
YES
CHECK IC1302
IC1308 (1,2) 4.5 V p-p ?
NO
CHECK IC280
YES
CHECK IC1308


NO RASTER
CRT G1 -48 V 0-p?
NO
YES
CRT G2 500~550 V ?
NO
CHECK R395 , FBT
YES
CRT KG,KR,KB 75 V 0-p ?
NO
NO CHARACTERS
YES
CRT EHT 27 KV ?
YES
CHECK CRT
NO
FBT (9) 127.5 V ?
NO
CHOPPER OUT
YES
Q690 (G) 11.4 V p-p ?
YES
CHECK Q690 , FBT
NO
Q644 (B) 12.2 V p-p ?
YES
CHECK Q644 , Q645
NO
CHECK IC850
EHT DRIVE PULSE
NO
Q267 (E) 2 V p-p ?
YES
Q381 (B) 11.5 V ?
NO
CHECK Q383 , Q384 , Q385
YES
G1 BIAS
N1003 (18) -200 V ?
NO
CHECK D604 , FBT
YES
CHECK Q381 D380 , D381 , D383
Q267 (B) 2.2 V p-p ?
YES
CHECK Q267
NO
Q260 (B) 2.6 V p-p ?
YES
CHECK Q260
NO
Q225 (B) 0.8 V p-p ?
NO
CHECK H PULSE LINE
YES
CHECK Q228 , Q225
Q680 (S) 210 V ?
NO
CHECK 195V Line
YES
CHOPPER DRIVE PULSE
Q680 (G) 200 V 0-p ?
NO
CHECK IC850
YES
CHECK Q680
O.S.D. DOES NOT WORK
EXAMPLE : MISSING GREEN.
CONDITION : OSD ON
IC1302 (5) 4.7 V p-p ?
YES
NO
IC1304 (5) 4.7 V p-p ?
NO
OSD H SYNC
CHECK Q1330 , H PULSE
YES
IC1304 (10) 4.7 V p-p ?
NO
OSD V SYNC
CHECK Q1331 , V FBP
YES
IC1304 (7,8) 4.7 V p-p ?
NO
OSD ACTIVE
CHECK SCL,SDA Line
YES
CHECK IC1304
IC1302 (1) 4.9 V p-p ?
NO
SELECT (VIDEO / OSD)
CHECK IC1304
YES
CHECK IC1302


NO POWER
C861(210V line) 210 V ?
YES
NO
T801 (1) CORRECT ?
NO
D821 (2)(3) AC CORRECT ?
YES
CHECK D821 , T801
NO
CHECK AC FUSE AC INPUT
YES
IC820 (4) 26 V ?
NO
Q820 (C) CORRECT ?
NO
CHECK R806 , R827
YES
CHECK Q820
YES
IC820 (8) 0.8 V ?
NO
CHECK R811 , R812 , R819
YES
CHECK IC820 , D823 D861 , D862 , D863 D864 , D865 , D868
ABNORMAL POWER SAVER
IC901 (16) 0 V IC901 (17) 4.9 V ?
YES
CHECK POWER SAVER
NO
H. SYNC
IC901 (29) 4.9 V p-p ?
NO
IC281 (5) 4.6 V p-p ?
YES
CHECK IC281
NO
IC280 (6) 2.3 V 0-p ?
YES
CHECK IC280
NO
IC1331 (12) 4.9 V p-p ?
YES
CHECK IC1331
NO
5V DC : CHECK SIG. SELECT
0V : CHECK INPUT SIGNAL
YES
V. SYNC
IC901 (27) 4.9 V p-p ?
YES
CHECK IC901
NO
IC281 (2) 3.4 V p-p ?
YES
CHECK IC281
NO
IC280 (8) 2.3 V 0-p ?
YES
CHECK IC280
NO
IC1331 (2) 4.9 V p-p ?
YES
CHECK IC1331
NO
5V DC : CHECK SIG. SELECT
0V : CHECK INPUT SIGNAL

T801 (1) VOLTAGE

AT AC100V	121V
AT AC120V	148V
AT AC220V	270V
AT AC240V	312V

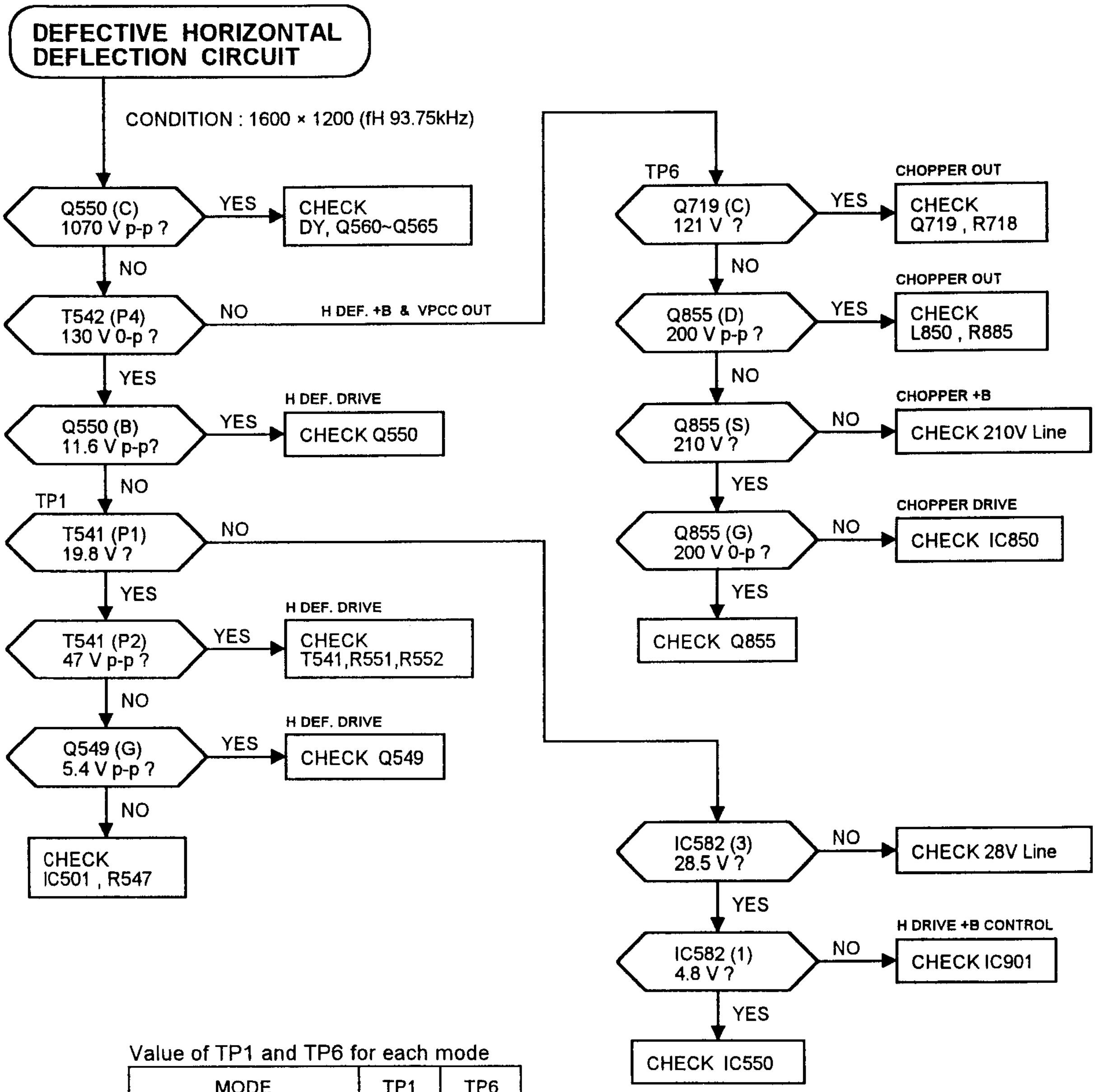
Q820 (C) VOLTAGE

AT AC100V	125V
AT AC120V	142V
AT AC220V	250V
AT AC240V	298V

IC901 (16) = SUSPEND
IC901 (17) = POWER OFF

SIGNAL INPUT PORT : 15P D-SUB

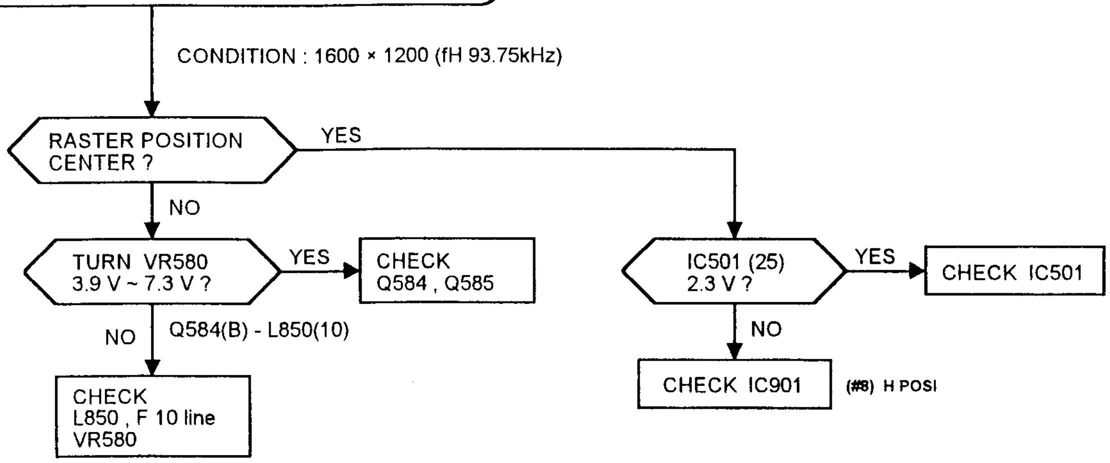
Please refer to repair hints for Power Save on page 64.


DEFECTIVE HORIZONTAL DEFLECTION CIRCUIT
CONDITION : 1600 × 1200 (fH 93.75kHz)
Q550 (C) 1070 V p-p ?
YES
CHECK DY, Q560~Q565
NO
T542 (P4) 130 V 0-p ?
NO
H DEF. +B & VPCC OUT
YES
Q550 (B) 11.6 V p-p?
YES
H DEF. DRIVE
CHECK Q550
NO
TP1
T541 (P1) 19.8 V ?
NO
YES
T541 (P2) 47 V p-p ?
YES
H DEF. DRIVE
CHECK T541,R551,R552
NO
Q549 (G) 5.4 V p-p ?
YES
H DEF. DRIVE
CHECK Q549
NO
CHECK IC501 , R547
TP6
Q719 (C) 121 V ?
YES
CHOPPER OUT
CHECK Q719 , R718
NO
Q855 (D) 200 V p-p ?
YES
CHOPPER OUT
CHECK L850 , R885
NO
Q855 (S) 210 V ?
NO
CHOPPER +B
CHECK 210V Line
YES
Q855 (G) 200 V 0-p ?
NO
CHOPPER DRIVE
CHECK IC850
YES
CHECK Q855
IC582 (3) 28.5 V ?
NO
CHECK 28V Line
YES
IC582 (1) 4.8 V ?
NO
H DRIVE +B CONTROL
CHECK IC901
YES
CHECK IC550

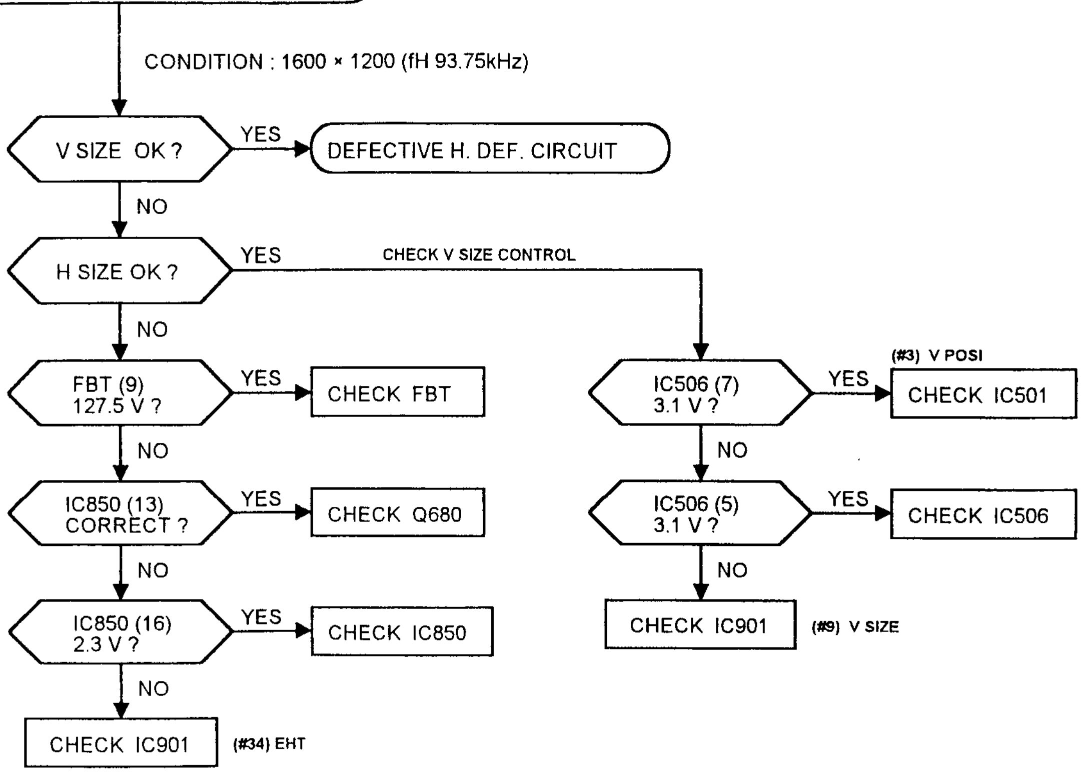
Value of TP1 and TP6 for each mode

MODE	TP1	TP6
MODE - 1 (f H 93.8kHz)	19.8 V	127.5 V
MODE - 2 (f H 31.5kHz)	23.7 V	74.3 V
MODE - 3 (f H 46.9kHz)	23.0 V	53.5 V
MODE - 4 (f H 60.0kHz)	22.3 V	70.8 V
MODE - 5 (f H 68.7kHz)	22.1 V	83.4 V
MODE - 6 (f H 63.3kHz)	22.3 V	75.4 V
MODE - 7 (f H 80.0kHz)	20.8 V	101.3 V
MODE - 8 (f H 87.5kHz)	20.5 V	115.6 V

INCORRECT H. POSITION CONTROL


CONDITION : 1600 × 1200 (fH 93.75kHz)
RASTER POSITION CENTER ?
YES
NO
TURN VR580 3.9 V ~ 7.3 V ?
YES
CHECK Q584 , Q585
NO
Q584(B) - L850(10)
CHECK L850 , F 10 line VR580
IC501 (25) 2.3 V ?
YES
CHECK IC501
NO
CHECK IC901
(#8) H POSI

INCORRECT SCREEN SIZE

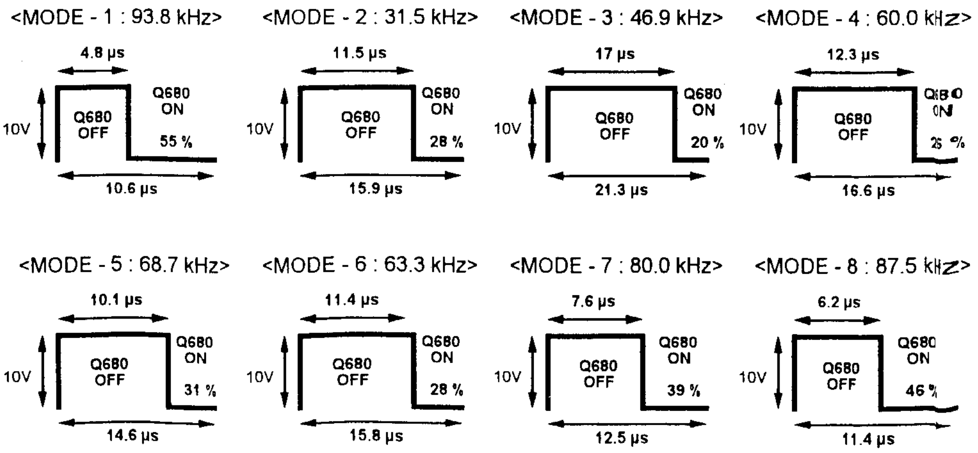

CONDITION : 1600 × 1200 (fH 93.75kHz)
V SIZE OK ?
YES
DEFECTIVE H. DEF. CIRCUIT
NO
H SIZE OK ?
YES
CHECK V SIZE CONTROL
NO
FBT (9) 127.5 V ?
YES
CHECK FBT
NO
IC850 (13) CORRECT ?
YES
CHECK Q680
NO
IC850 (16) 2.3 V ?
YES
CHECK IC850
NO
CHECK IC901
(#34) EHT
IC506 (7) 3.1 V ?
YES
(#3) V POSI
CHECK IC501
NO
IC506 (5) 3.1 V ?
YES
CHECK IC506
NO
CHECK IC901
(#9) V SIZE

IC850 (13) Wave

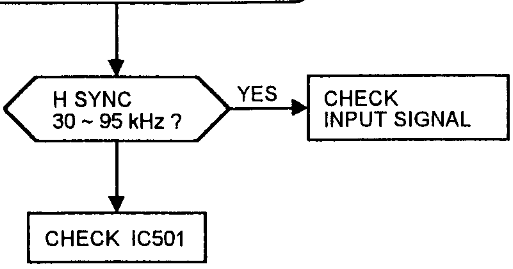
IC850 (20) [2FH]	
30~40 kHz	HIGH
40~95 kHz	LOW

When Low level is applied to 20 pin, IC850 will supply ×2 f H signal to Q680 and Q690.

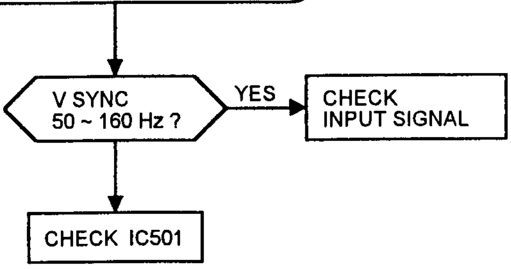
(IC850 13 & 23 pin)



H. SYNC DOES NOT HOLD

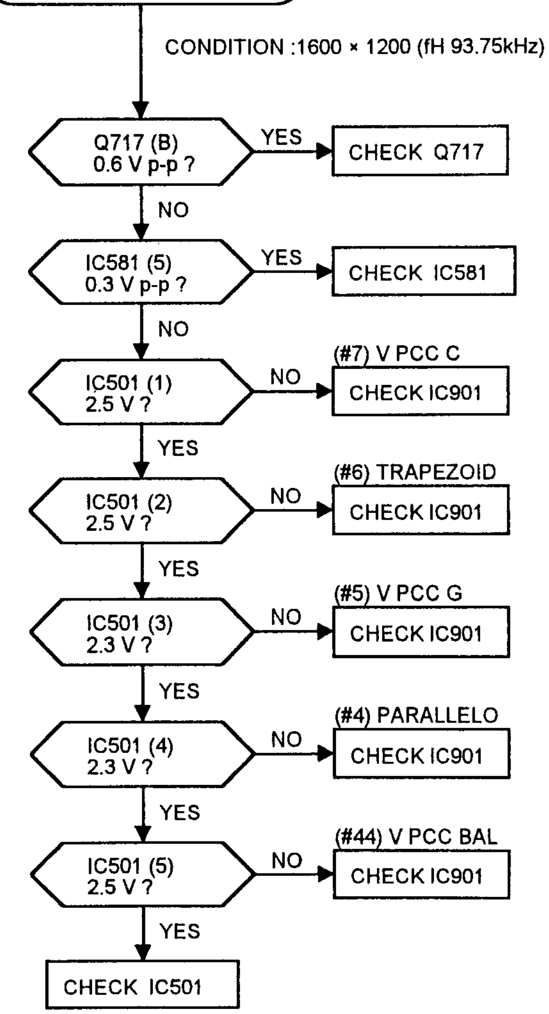

H SYNC
30 ~ 95 kHz ?
YES
CHECK INPUT SIGNAL
CHECK IC501

V. SYNC DOES NOT HOLD

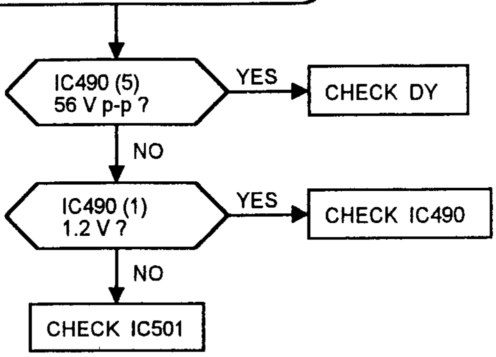

V SYNC
50 ~ 160 Hz ?
YES
CHECK INPUT SIGNAL
CHECK IC501

If no horizontal and/or vertical sync from PC, then the power save circuit becomes active.

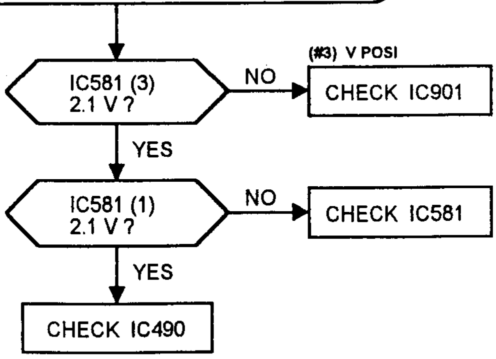
INCORRECT V.PCC


CONDITION :1600 × 1200 (fH 93.75kHz)
Q717 (B)
0.6 V p-p ?
YES
CHECK Q717
NO
IC581 (5)
0.3 V p-p ?
YES
CHECK IC581
NO
IC501 (1)
2.5 V ?
NO
(#7) V PCC C
CHECK IC901
YES
IC501 (2)
2.5 V ?
NO
(#6) TRAPEZOID
CHECK IC901
YES
IC501 (3)
2.3 V ?
NO
(#5) V PCC G
CHECK IC901
YES
IC501 (4)
2.3 V ?
NO
(#4) PARALLELO
CHECK IC901
YES
IC501 (5)
2.5 V ?
NO
(#44) V PCC BAL
CHECK IC901
YES
CHECK IC501

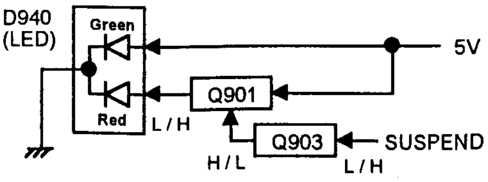
BRIGHT HORIZONTAL LINE APPEARS ON THE SCREEN


IC490 (5)
56 V p-p ?
YES
CHECK DY
NO
IC490 (1)
1.2 V ?
YES
CHECK IC490
NO
CHECK IC501

INCORRECT V. POSITION CONTROL

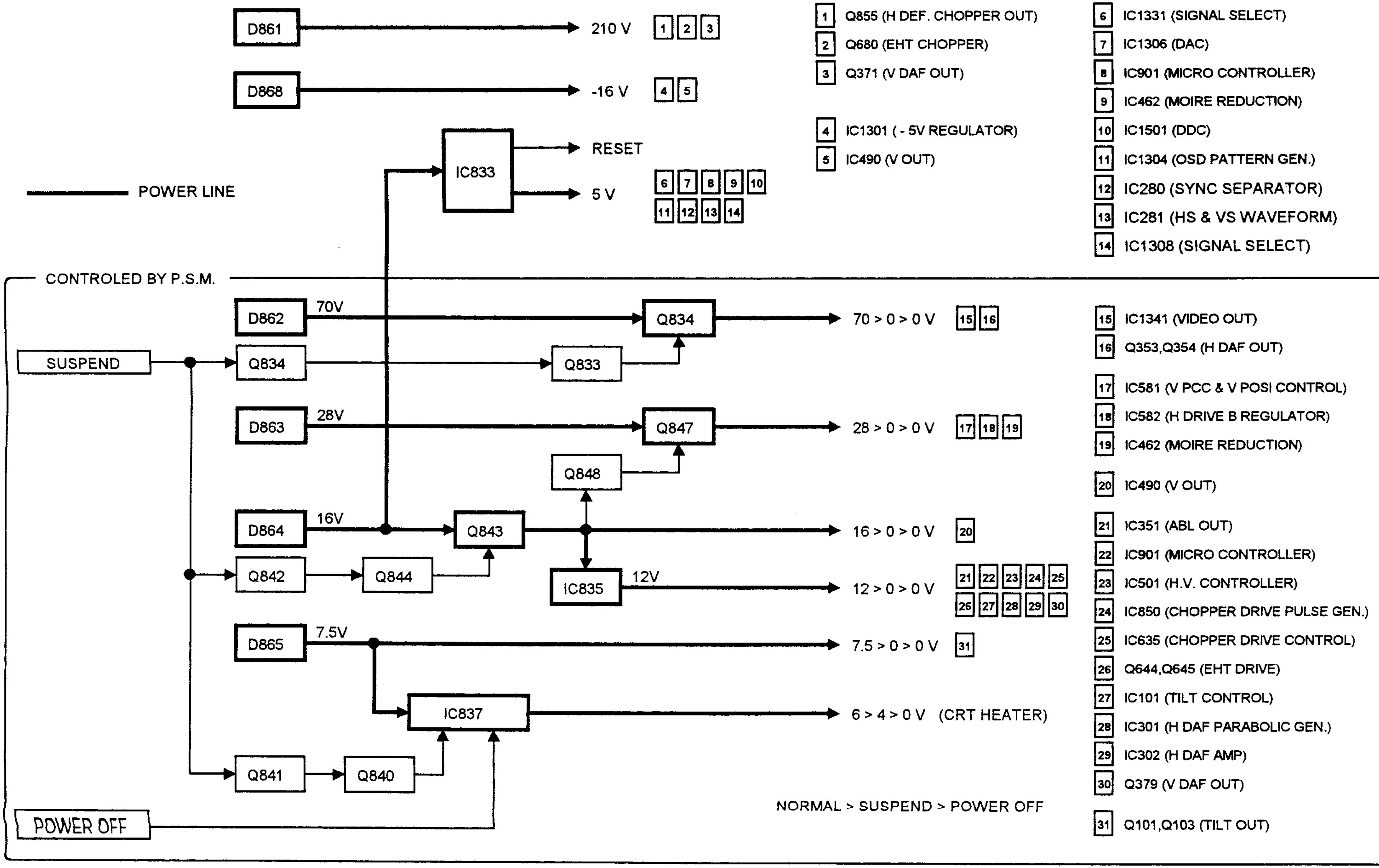

IC581 (3)
2.1 V ?
NO
(#3) V POSI
CHECK IC901
YES
IC581 (1)
2.1 V ?
NO
CHECK IC581
YES
CHECK IC490

ABNORMAL POWER INDICATOR


D940
(LED)
Green
Red
5V
Q901
L / H
Q903
SUSPEND
H / L
L / H

HS	VS	SUSPEND	COLOR
ON	ON	LOW	GREEN
OFF	ON	HIGH	YELLOW
ON	OFF	HIGH	YELLOW
OFF	OFF	HIGH	YELLOW

REPAIR HINTS FOR POWER SAVE (HV8SA CHASSIS)


D861
210 V
1 2 3
D868
-16 V
4 5
IC833
RESET
5 V
6 7 8 9 10
11 12 13 14
POWER LINE
CONTROLED BY P.S.M.
D862
70V
Q834
70 > 0 > 0 V
15 16
SUSPEND
Q834
Q833
D863
28V
Q847
28 > 0 > 0 V
17 18 19
Q848
D864
16V
Q843
16 > 0 > 0 V
20
Q842
Q844
IC835
12V
12 > 0 > 0 V
21 22 23 24 25
26 27 28 29 30
D865
7.5V
7.5 > 0 > 0 V
31
IC837
6 > 4 > 0 V (CRT HEATER)
Q841
Q840
POWER OFF
NORMAL > SUSPEND > POWER OFF

1 Q855 (H DEF. CHOPPER OUT)
2 Q680 (EHT CHOPPER)
3 Q371 (V DAF OUT)

4 IC1301 (- 5V REGULATOR)
5 IC490 (V OUT)

6 IC1331 (SIGNAL SELECT)
7 IC1306 (DAC)
8 IC901 (MICRO CONTROLLER)
9 IC462 (MOIRE REDUCTION)
10 IC1501 (DDC)
11 IC1304 (OSD PATTERN GEN.)
12 IC280 (SYNC SEPARATOR)
13 IC281 (HS & VS WAVEFORM)
14 IC1308 (SIGNAL SELECT)

15 IC1341 (VIDEO OUT)
16 Q353,Q354 (H DAF OUT)

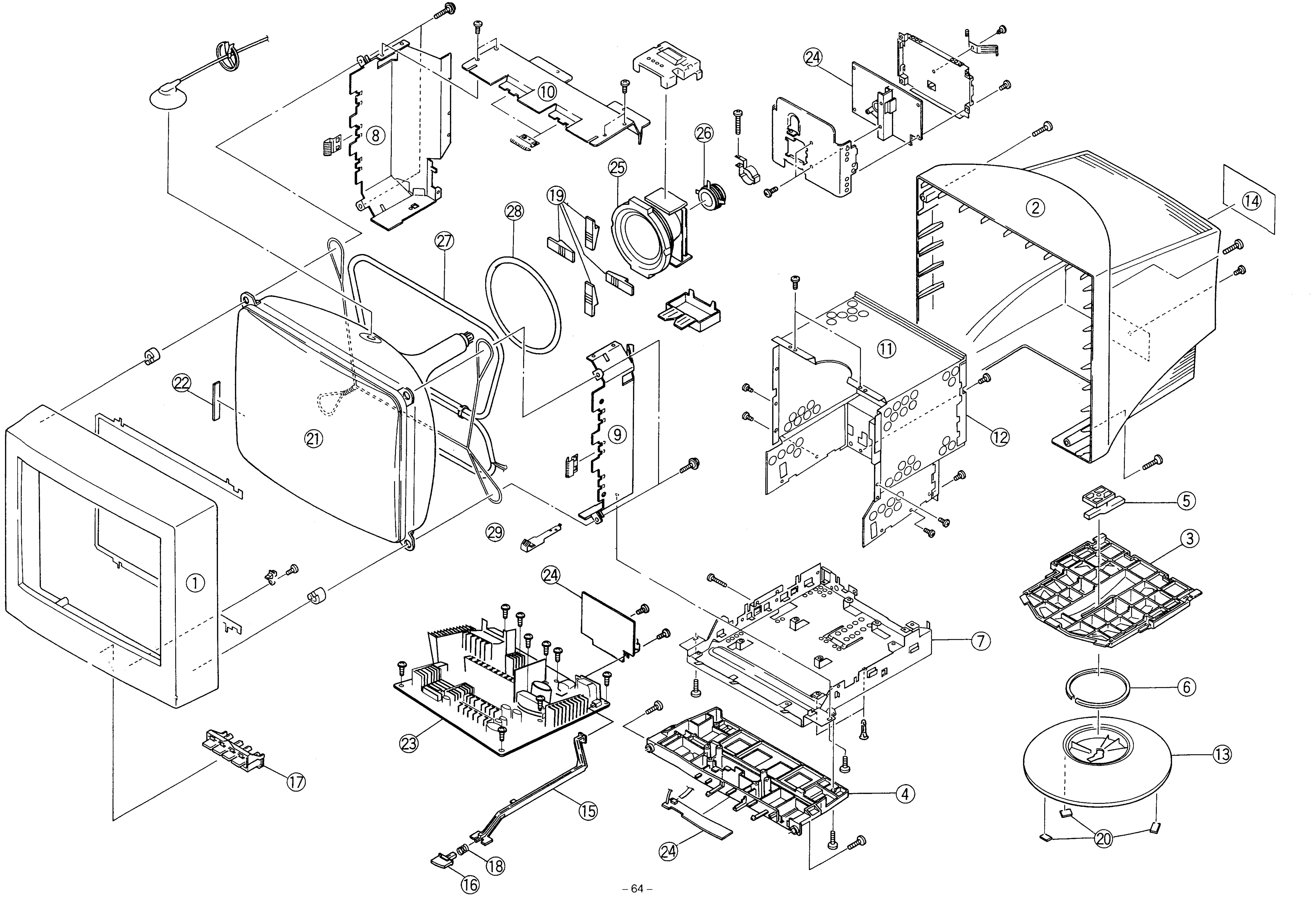
17 IC581 (V PCC & V POSI CONTROL)
18 IC582 (H DRIVE B REGULATOR)
19 IC462 (MOIRE REDUCTION)

20 IC490 (V OUT)

21 IC351 (ABL OUT)
22 IC901 (MICRO CONTROLLER)
23 IC501 (H.V. CONTROLLER)
24 IC850 (CHOPPER DRIVE PULSE GEN.)
25 IC635 (CHOPPER DRIVE CONTROL)
26 Q644,Q645 (EHT DRIVE)
27 IC101 (TILT CONTROL)
28 IC301 (H DAF PARABOLIC GEN.)
29 IC302 (H DAF AMP)
30 Q379 (V DAF OUT)

31 Q101,Q103 (TILT OUT)

EXPLODED VIEW



①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
⑫
⑬
⑭
⑮
⑯
⑰
⑱
⑲
⑳
㉑
㉒
㉓
㉔
㉕
㉖
㉗
㉘
㉙

REPLACEMENT PARTS LIST

Important Safety Notice

Components identified by the International symbol ⚠ have special characteristics important for safety. When replacing any of these components use only manufacture's specified parts.

RESISTOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Carbon	F	± 1%
F	Fuse	J	± 5%
M	Metal Oxide	K	± 10%
S	Solid	M	± 20%
W	Wire Wound	G	± 2%

Part No. Description
Example ERD25TJ104 Ⓒ 100K Ⓙ 1/4W

CAPACITOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Ceramic	C	± 0.25pF
E	Electrolytic	D	± 0.5pF
P	Polyester	F	± 1pF
S	Styrol	J	± 5%
T	Tantalum	K	± 10%
PP	Polypropylene	L	± 15%
		M	± 20%
		P	+100% – 0%
		Z	+80% – 20%

Part No. Description
Example: ECKF1H103ZF Ⓒ 0.01μF Ⓩ 50V

	Ref.No.	Part No.	Description
		CABINET & MAIN PARTS	
⚠	1	TTYA03201-7	ESCUTCHEON<-M>
⚠	1	TTYA03206-5	ESCUTCHEON<-E,-G,-SW,-U>
⚠	2	TZTKU0100CQ	REAR COVER W/MODEL LABEL <-M>
⚠	2	TZTKU0100DA	REAR COVER W/MODEL LABEL <-G>
⚠	2	TZTKU0100DB	REAR COVER W/MODEL LABEL <-SW>
⚠	2	TZTKU0100DC	REAR COVER W/MODEL LABEL <-U>
⚠	2	TZTKU0100DF	REAR COVER W/MODEL LABEL <-E>
⚠		TKGF5024	LED LENS
⚠	3	TKSG001-A01	BOTTOM CABINET<-M>
⚠	3	TKSG001-A06	BOTTOM CABINET <-E,-G,-SW,-U>
⚠	4	TKSG004-B01	BASE CABINET<-M>
⚠	4	TKSG004-B02	BASE CABINET <-E,-G,-SW,-U>
⚠	5	TKKX5010	CENTER POST<-M>
⚠	5	TKKX5010-1	CENTER POST<-E,-G,-SW,-U>
	6	TKKX5011-1	SPACER RING
⚠		TKK859745-9	CONNECTOR COVER
	7	TUAA06401-1	BOTTOM PLATE
		TSAA3004	RADIATOR
	8	TUCC5083-1	SHIELD CASE(CRT)R
	9	TUCC5084-1	SHIELD CASE(CRT)L
	10	TUCC5085-1	SHIELD CASE BRACKET
	11	TUCC5115	SHIELD CASE
	12	TUCC5116-2	SHIELD CASE(REAR)
⚠	13	TBLB3002-A01	PEDESTAL<-M>
⚠	13	TBLB3002-A06	PEDESTAL<-E,-G,-SW,-U>
⚠	14	TBMD061	MODEL NAME LABEL<-M>
⚠	14	TBMD161	MODEL NAME LABEL<-G>

	Ref.No.	Part No.	Description
⚠	14	TBMD162	MODEL NAME LABEL<-SW>
⚠	14	TBMD163	MODEL NAME LABEL<-U>
⚠	14	TBMD187	MODEL NAME LABEL<-E>
⚠	16	TBXA03401	KNOB(POWER SWITCH)
⚠	15	TBXA04401	POWER SWITCH SHAFT
⚠	17	TBXA14101	KNOB(CONTROL)
		TESA012	SPRING(CRT EARTH)
		TESA046	SPRING(CRT EARTH,BOTTOM)
	18	TESD008	SPRING(POWER SWITCH)
		TESH017	FBT SPRING
		TES8586	EARTH SPRING
⚠		TMME023	TILT COIL CLAMPER(BIG)
⚠		TMME035	DEGAUSS COIL CLAMPER,SIDE
⚠		TMME052	LEAD CLAMPER(SMALL)
⚠		TMME067	DEGAUSS COIL CLAMPER
⚠		TMM15404-1	SPACER RING
⚠		TMM16452	TILT COIL CLAMPER
⚠		TMM6463	CLAMPER
⚠		TMM81499	PUSH RIVET
		TMM85576-1	CRT RUBBER
⚠	19	TMM85586	RUBBER(WEDGE)
⚠		TMX13418	PCB SPACER
⚠		TMKG035	SPONGE
⚠		TMKG067	RUBBER CUSHION(BIG)
⚠	20	TMK84990	SET LEG
⚠		TMK85572	FERRITE STICK
		TQFX040	CONDUCTIVE SHEET
		THT1028	SCREW(FOR CRT)
		THT1069	SCREW(FOR SHIELD CASE)
		XTB4+12J	SCREW
		XTN5+16LY	SCREW
		XTV3+10A	SCREW
		XTV3+20J	SCREW
		XTV3+8A	SCREW
		XYA4+EF8	SCREW
		XYA4+EJ10	SCREW
		XYE3+EJ10	SCREW

	Ref.No.	Part No.	Description
⚠	21	M51KYY540X	COLOR PICTURE TUBE
		TNPA0892-21	PC BOARD W/COMPONENT (SSP/TCO)
⚠	23	TNPH0173-21	PC BOARD W/COMPONENT (MAIN)
	24	TXANP31F63NM	PC BOARD W/COMPONENT (VIDEO INPUT/CRT/KBD)
⚠	25	MEY51LHB4	DEFLECTION YOKE
⚠	26	TLCB006-1	CONVERGENCE COIL
⚠	27	TSPA026-6	DEGAUSS COIL
⚠	28	TSPF004-2	TILT COIL
		TSXL030	FLAT CORD(5P)
⚠		TSXL055	FLAT CORD(20P)
⚠		TSXX075	SCREEN LEAD(RED)
⚠		TSXX076	FOCUS LEAD(RED)
⚠		TSXX077	FOCUS LEAD(WHITE)
		TSX4515-3	SIGNAL CORD
⚠		TSXA023	POWER CORD<-M>
⚠		TSX8484	POWER CORD<-E,-G>
⚠		TSX8492	POWER CORD<-SW>
⚠		TSX8493	POWER CORD<-U>
⚠		TSXX053	4P CONNECTOR ASSY
⚠		TXA3A11F63NM	CRT EARTH LEAD
		TSMA003	MAGNET
		T4F31519Q	POLYESTER TAPE(50M)
		T4F72425Q	COTTON TAPE(55M)
		T4F90240	MAIRA TAPE
		TPCA54001	OUTER CARTON<-M>
		TPCA58901	OUTER CARTON <-E,-G,-SW,-U>
		TXAPD1D1F63T	FILLER(TOP)<-E,-G,-SW,-U>
		TXAPD1D2162T	FILLER(TOP)<-M>
		TXAPD3D2162B	FILLER(BOTTOM)
		TPE894011-2	SET COVER
		TQE8513-2	FUN BAG COVER
		TQE8660	BAG(FOR REG. CARD)<-M>
		TQBE0151	INSTRUCTION BOOK(TCO95) <-E,-G,-SW,-U>
⚠		TQBE0198	INSTRUCTION BOOK<-M>
⚠		TQBE0225	INSTRUCTION BOOK <-E,-G,-SW,-U>
		TQD1712010	PASS CARD
		TQDE18002-1	WARRANTY CARD<-E>
		TQD8515106-3	WARRANTY CARD<-M>
		TQD8518073-3	WARRANTY CARD<-U>
		TQD8515100	REGISTRATION CARD<-M>
		TQFA360	WARNING LABEL<-M>
		TQFA471	TCO95 LABEL<-E,-G,-SW,-U>
		TQFA532	PTB LABEL(INNER)<-M>
		TQF83825-6	SERIAL NO. LABEL
		TQF85363-2	CARTON LABEL<-G>
		TQF85363-3	CARTON LABEL<-SW>
		TQF85363-4	CARTON LABEL<-U>
		TQF85363-8	CARTON LABEL<-E>
⚠		TQF86550	EARTH CAUTION LABEL<-SW>
⚠		TQF86608	EARTH CAUTION LABEL <-E,-G,-M>
		I.C	
	IC31	AN5768	IC
	IC101	CU32110A-102	IC
	IC102	TVRB030-1	IC

	Ref.No.	Part No.	Description
	IC103	TVSA0066	IC
	IC104	24LC08BTISN	IC
	IC106	LF347MX	IC
	IC107	LF347MX	IC
	IC111	TC74HC14AF	IC
	IC120	NJM2904M	IC
	IC303	LF353MX	IC
	IC491	LA7875	IC
	IC510	LA6500-FA	IC
	IC511	AN8025M	IC
	IC512	NJM2904M	IC
	IC580	AN6531	IC
	IC671	TVSA0216	HYBRID IC
	IC672	NJM2904M	IC
	IC673	NJM2904M	IC
	IC674	TA76431S	IC
	IC821	M62281FP	IC
	IC830	M5F7812L	IC
	IC831	SI-3025F	HYBRID IC
	IC832	AN78L05	IC
	IC833	AN79M05F	IC
	IC841	MIP0223SCL	IC
	IC850	M62501FP	IC
	IC851	L78MR05	IC
	IC852	TL431AIZ	IC
	IC1301	M52741SP700	IC
⚠	IC1302	VP3628	HYBRID IC
	IC1303	STK190-110	HYBRID IC
	IC1305	TA76431S	IC
	IC1306	L78M09T	IC
	IC1321	NJM2904M	IC
	IC1331	MM74HCT00MX	IC
	IC1381	NJM2904M	IC
	IC1401	LSC4385DW2	IC
		TRANSISTORS	
	IC560	SLA5041	TRANSISTOR
	Q11	2SK1848	TRANSISTOR
	Q12	2SD602R	TRANSISTOR
	Q13	2SC4080DETD	TRANSISTOR
	Q14	2SC4412-45	TRANSISTOR
	Q15	2SA1682-45	TRANSISTOR
	Q106	2SC3938R	TRANSISTOR
	Q107	IMH11A	TRANSISTOR
	Q108	IMH11A	TRANSISTOR
	Q110	2SC3938R	TRANSISTOR
	Q280	2SA1739R	TRANSISTOR
	Q286	2SC3938R	TRANSISTOR
	Q379	2SC4081R	TRANSISTOR
	Q380	2SC4620V25	TRANSISTOR
	Q381	2SA1576A	TRANSISTOR
	Q382	2SC1473AR	TRANSISTOR
	Q383	2SD1264PLB	TRANSISTOR
	Q384	2SB940PLB	TRANSISTOR
	Q510	2SC1473AR	TRANSISTOR
	Q535	2SD1820AR	TRANSISTOR
	Q536	2SB1219AQ	TRANSISTOR
	Q549	2SK2588	TRANSISTOR
	Q550	2SC5423002FD	TRANSISTOR
	Q560	UN5211AI	TRANSISTOR
	Q562	UN5211AI	TRANSISTOR
	Q564	UN5211AI	TRANSISTOR

Ref.No.	Part No.	Description
Q566	UN5211AI	TRANSISTOR
Q575	2SC4081R	TRANSISTOR
Q601	2SK2761-01MR	TRANSISTOR
Q820	2SA733Q	TRANSISTOR
Q821	2SK2148	TRANSISTOR
Q827	2SA733Q	TRANSISTOR
Q853	UN5211AI	TRANSISTOR
Q858	2SD1949Q	TRANSISTOR
Q859	UN5211AI	TRANSISTOR
Q860	2SC3938R	TRANSISTOR
Q864	2SB1219AQ	TRANSISTOR
Q881	2SJ306MRB	TRANSISTOR
Q882	2SB1219AQ	TRANSISTOR
Q890	2SK1848	TRANSISTOR
Q901	2SD1949Q	TRANSISTOR
Q902	UN5111AI	TRANSISTOR
Q903	UN5211AI	TRANSISTOR
Q1001	2SC4270	TRANSISTOR
Q1002	2SC4270	TRANSISTOR
Q1030	2SC4270	TRANSISTOR
Q1031	2SC4270	TRANSISTOR
Q1032	2SA1764	TRANSISTOR
Q1065	2SC4412-45	TRANSISTOR
Q1101	2SC4270	TRANSISTOR
Q1102	2SC4270	TRANSISTOR
Q1130	2SC4270	TRANSISTOR
Q1131	2SC4270	TRANSISTOR
Q1132	2SA1764	TRANSISTOR
Q1165	2SC4412-45	TRANSISTOR
Q1201	2SC4270	TRANSISTOR
Q1202	2SC4270	TRANSISTOR
Q1230	2SC4270	TRANSISTOR
Q1231	2SC4270	TRANSISTOR
Q1232	2SA1764	TRANSISTOR
Q1265	2SC4412-45	TRANSISTOR
Q1301	2SA1576A	TRANSISTOR
Q1302	2SA1576A	TRANSISTOR
Q1303	UN5211AI	TRANSISTOR
Q1304	UN5211AI	TRANSISTOR
Q1345	UN5111AI	TRANSISTOR
Q1346	2SA1739R	TRANSISTOR
Q1370	2SC3938R	TRANSISTOR
Q1371	2SC3757Q	TRANSISTOR
Q1380	2SA1576A	TRANSISTOR
Q1381	UN5211AI	TRANSISTOR
Q1382	2SA1767Q	TRANSISTOR
Q1383	2SD1819AQ	TRANSISTOR
	DIODES	
D10	MA8150M	DIODE
D11	MA153A	DIODE
D12	MA4150NM	DIODE
D13	MA174	DIODE
D14	MA111	DIODE
D15	MA2330B	DIODE
D102	MA714	DIODE
D110	DTZTT115R6B	DIODE
D117	MA714	DIODE
D129	MA357	DIODE
D201	MA8056M	DIODE
D202	MA8056M	DIODE
D211	MA8056M	DIODE

Ref.No.	Part No.	Description
D212	MA8056M	DIODE
D251	MA8056M	DIODE
D252	MA8056M	DIODE
D351	MA111	DIODE
D352	MA111	DIODE
D363	MA4390NM	DIODE
D364	MA4390NM	DIODE
D365	MA4390NM	DIODE
D366	MA199	DIODE
D410	ERA1502	DIODE
D411	ERA1502	DIODE
D421	MA151K	DIODE
D440	MA4051NM	DIODE
D550	FMQ-G5GSLF	DIODE
D551	ERA81004	DIODE
D552	MA111	DIODE
D553	MA8150M	DIODE
D575	MA4047NM	DIODE
D577	MA111	DIODE
D602	ESAC39M-06D	DIODE
D604	ERA92-02	DIODE
D605	ERA92-02	DIODE
D651	MA167	DIODE
D652	TVSAG01	DIODE
D653	TVSAG01	DIODE
D654	MA111	DIODE
D673	MA165	DIODE
D674	MA142WK	DIODE
D680	MA4075NM	DIODE
D821	RBV606	DIODE
D822	RG2A2	DIODE
D824	MA4300NM	DIODE
D825	MA113	DIODE
D826	MA165	DIODE
D833	MA4082NM	DIODE
D840	TAB101K201T	VARISTOR
D841	EG01Z	DIODE
D842	MA4150NL	DIODE
D843	ERA34-10	DIODE
D850	MA111	DIODE
D851	ERC91-02	DIODE
D855	MA4091NM	DIODE
D856	CB903-4	DIODE
D857	MA111	DIODE
D858	MA111	DIODE
D861	EG01A	DIODE
D862	FML-S16S	DIODE
D863	TVSRG2	DIODE
D864	FML-G02S	DIODE
D865	ERC30-02	DIODE
D866	ERC30-02	DIODE
D867	EG01A	DIODE
D868	RN3Z014-305	DIODE
D869	MA111	DIODE
D871	MA4180NM	DIODE
D872	MA4022L	DIODE
D873	MA748	DIODE
D874	MA719	DIODE
D875	MA719	DIODE
D876	MA719	DIODE
D878	MA748	DIODE
D890	MA142WK	DIODE

	Ref.No.	Part No.	Description
	D891	MA111	DIODE
	D892	TVSD0003	DIODE
	D897	MA8150M	DIODE
	D901	MA111	DIODE
	D902	TVSD0003	DIODE
	D953	MA4056NM	DIODE
	D978	MA4056NM	DIODE
	D979	MA4056NM	DIODE
	D990	SML1816W	DIODE(LED)
	D993	MA8056H	DIODE
	D994	MA8056H	DIODE
	D995	MA8056H	DIODE
	D996	MA8056H	DIODE
	D1001	MA111	DIODE
	D1002	MA111	DIODE
	D1003	MA111	DIODE
	D1011	MA111	DIODE
	D1012	MA111	DIODE
	D1013	MA111	DIODE
	D1020	MA111	DIODE
	D1021	MA111	DIODE
	D1030	DCC010	DIODE
	D1051	MA2Z001	DIODE
	D1052	MA2Z001	DIODE
	D1065	MA167A	DIODE
	D1101	MA111	DIODE
	D1102	MA111	DIODE
	D1103	MA111	DIODE
	D1111	MA111	DIODE
	D1112	MA111	DIODE
	D1113	MA111	DIODE
	D1120	MA111	DIODE
	D1121	MA111	DIODE
	D1130	DCC010	DIODE
	D1151	MA2Z001	DIODE
	D1152	MA2Z001	DIODE
	D1165	MA167A	DIODE
	D1201	MA111	DIODE
	D1202	MA111	DIODE
	D1203	MA111	DIODE
	D1211	MA111	DIODE
	D1212	MA111	DIODE
	D1213	MA111	DIODE
	D1220	MA111	DIODE
	D1221	MA111	DIODE
	D1230	DCC010	DIODE
	D1251	MA2Z001	DIODE
	D1252	MA2Z001	DIODE
	D1265	MA167A	DIODE
	D1301	MA142WA	DIODE
	D1302	MA142WA	DIODE
	D1324	MA4056NM	DIODE
	D1325	MA188	DIODE
	D1326	MA111	DIODE
	D1331	MA111	DIODE
	D1340	MA4051NM	DIODE
	D1341	MA4051NM	DIODE
	D1342	MA4051NM	DIODE
	D1343	MA4051NM	DIODE
	D1344	MA4051NM	DIODE
	D1345	MA4051NM	DIODE
	D1346	MA4051NM	DIODE
	D1347	MA8330M	DIODE
	D1348	MA111	DIODE
	D1349	MA8330M	DIODE
	D1371	MA111	DIODE
	D1381	MA111	DIODE
	D1382	EU02Z	DIODE
	D1383	MA8100L	DIODE
		COIL & TRANSFORMERS	
	L101	ELJFA5R6JB	CHIP COIL
⚠	L501	ELC18B272G	CHOKE COIL
	L503	TLH85815T	COIL
	L530	ELEY102KA	PEAKING COIL
	L532	TLH85815T	COIL
	L550	EXCELSA35T	LC COMBINATION
	L551	EXCELSA35T	LC COMBINATION
⚠	L577	ELHKLB030B	COIL
⚠	L578	ELHKLB031B	COIL
	L601	TLUADTB100K	PEAKING COIL
	L602	TLUACNB220K	PEAKING COIL
	L603	TSK8029	FERRITE CORE
	L605	TSK8029	FERRITE CORE
	L680	TSK8029	FERRITE CORE
⚠	L801	ELF18D666V	LINE FILTER
⚠	L802	ELF18D666V	LINE FILTER
	L820	EXCELDR35C	LC COMBINATION
⚠	L850	TLP85708R	CHOKE COIL
	L861	TSK8029	FERRITE CORE
	L862	TSK8029	FERRITE CORE
	L863	TSK8029	FERRITE CORE
	L864	TSK8029	FERRITE CORE
	L865	TSK8029	FERRITE CORE
	L866	TSK8029	FERRITE CORE
	L868	TSK8029	FERRITE CORE
	L881	TLUACNB102J	PEAKING COIL
	L898	TLUACNB102J	PEAKING COIL
	L1320	EXCELDR35C	LC COMBINATION
	L1321	TSKA092	FERRITE CORE
	L1322	TSKA092	FERRITE CORE
	L1323	TSKA092	FERRITE CORE
	L1324	TSKA092	FERRITE CORE
	L1327	ELESN221KA	PEAKING COIL
	L1340	EXCELDR35C	LC COMBINATION
	L1341	EXCELDR35C	LC COMBINATION
	L1351	EXCELDR35C	LC COMBINATION
	L1352	EXCELDR35C	LC COMBINATION
	L1354	EXCELDR35C	LC COMBINATION
	L1401	ELEXH151KA	PEAKING COIL
⚠	T351	TLHG010	D.A.F. TRANSFORMER
⚠	T541	ETH19K179AM	H.DRIVE TRANSFORMER
⚠	T542	ETS29AC1Z9AC	TRANSFORMER
⚠	T601	TLFA01365	FLYBACK TRANSFORMER
⚠	T821	TLPA052	POWER TRANSFORMER
⚠	T823	TLPA039	POWER TRANSFORMER(SUB)
		CAPACITORS	
	C11	ECQV1H334JL	P 0.33UF J 50V
	C13	ECJ2VF1H104Z	C 0.1UF Z 50V
	C14	ECJ2VF1H104Z	C 0.1UF Z 50V
	C16	ECUX1H102JCX	C 1000PF J 50V
	C17	ECQE2104KF	P 0.1UF K 200V

Ref.No.	Part No.	Description				Ref.No.	Part No.	Description			
C31	ECEA1HGE4R7	E	4.7UF		50V	C190	ECUX1H562JCW	C	5600PF	J	50V
C32	ECEA1HGE4R7	E	4.7UF		50V	C196	ECUX1H101JCG	C	100PF	J	50V
C50	ECJ2VF1C105Z	C	1UF	Z	16V	C255	ECJ2VF1H104Z	C	0.1UF	Z	50V
C51	ECJ2VF1C105Z	C	1UF	Z	16V	C256	ECJ2VF1H104Z	C	0.1UF	Z	50V
C52	ECJ2VF1C105Z	C	1UF	Z	16V	C257	ECUX1H271JCG	C	270PF	J	50V
C53	ECJ2VF1C105Z	C	1UF	Z	16V	C258	ECUX1H121JCG	C	120PF	J	50V
C55	ECJ2VF1C105Z	C	1UF	Z	16V	C259	ECUX1H150JCN	C	15PF	J	50V
C56	ECJ2VF1C105Z	C	1UF	Z	16V	C280	ECA1HEN010	E	1UF		50V
C58	ECJ2VF1C105Z	C	1UF	Z	16V	C281	ECUX1H103KBG	C	0.01UF	K	50V
C101	ECUX1H150JCN	C	15PF	J	50V	C352	ECA2CHG100	E	10UF		160V
C102	ECUX1H150JCN	C	15PF	J	50V	C353	ECQV1474JZ	P	0.47UF	J	100V
C104	ECUX1H103KBG	C	0.01UF	K	50V	C369	ECA1HHG470	E	47UF		50V
C108	ECUX1H101JCG	C	100PF	J	50V	C370	ECUX1H361JCG	C	360PF	J	50V
C110	ECJ2VF1H104Z	C	0.1UF	Z	50V	C371	ECKD2H471KB5	C	470PF	K	500V
C111	ECA0JHG471	E	470UF		6.3V	C372	ECUX1H080DCN	C	8PF	D	50V
C113	ECUX1C104KBX	C	0.1UF	K	16V	C373	ECEA2EGE100	E	10UF		250V
C114	ECUX1H102KBN	C	1000PF	K	50V	C375	ECUX1H103KBG	C	0.01UF	K	50V
C115	ECUX1H102KBN	C	1000PF	K	50V	C376	ECA1CHG221	E	220UF		16V
C117	ECJ2VF1H104Z	C	0.1UF	Z	50V	C377	ECEA1EGE330	E	33UF		25V
C118	ECJ2VF1H104Z	C	0.1UF	Z	50V	C380	ECQE2104KF	P	0.1UF	K	200V
C119	ECUX1H222JCX	C	2200PF	J	50V	C440	ECA1EHG222	E	2200UF		25V
C122	ECUX1C105KBW	C	1UF	K	16V	C441	TACCC1H100MT	E	10UF		50V
C123	ECJ2VF1H104Z	C	0.1UF	Z	50V	C444	TACCC1H101MT	E	100UF		50V
C124	ECUX1H103KBG	C	0.01UF	K	50V	C445	TACCC1H101MT	E	100UF		50V
C125	ECJ2VF1H104Z	C	0.1UF	Z	50V	C446	ECUX1H102KBN	C	1000PF	K	50V
C126	ECUX1H472KBG	C	4700PF	K	50V	C447	ECA1EHG222	E	2200UF		25V
C130	ECEV1CG100G	E	10UF		16V	C448	ECQV1473JM	P	0.047UF	J	100V
C131	ECA0JHG471	E	470UF		6.3V	C449	ECUX1H103KBG	C	0.01UF	K	50V
C132	ECJ2VF1H104Z	C	0.1UF	Z	50V	C450	ECQE1474KF	P	0.47UF	K	100V
C133	ECEV1CG100G	E	10UF		16V	C451	ECQE1563KF	P	0.056UF	K	100V
C134	ECJ2VF1H104Z	C	0.1UF	Z	50V	C501	TACBH2E224MT	C	0.22UF	M	250V
C137	ECJ2VF1H104Z	C	0.1UF	Z	50V	C503	ECJ2VF1H104Z	C	0.1UF	Z	50V
C138	ECEV1CG100G	E	10UF		16V	C504	ECA2AHG100	E	10UF		100V
C139	ECJ2VF1H104Z	C	0.1UF	Z	50V	C505	ECJ2VF1C105Z	C	1UF	Z	16V
C140	ECJ2VF1H104Z	C	0.1UF	Z	50V	C506	ECJ2VF1H104Z	C	0.1UF	Z	50V
C141	ECJ2VF1H104Z	C	0.1UF	Z	50V	C508	ECUX1E473KBX	C	0.047UF	K	25V
C143	ECUX1H101JCG	C	100PF	J	50V	C530	ECA2EHG2R2	E	2.2UF		250V
C144	ECUX1H101JCG	C	100PF	J	50V	C551	ECA1VHG101	E	100UF		35V
C145	ECJ2VF1H104Z	C	0.1UF	Z	50V	C552	TACBN2A332KT	C	3300PF	K	100V
C151	ECJ2VF1H104Z	C	0.1UF	Z	50V	C553	ECWH20222HV	PP	2200PF	H	1.5KV
C152	ECJ2VF1H104Z	C	0.1UF	Z	50V	C554	ECWH20222HV	PP	2200PF	H	1.5KV
C153	ECUX1C224KBX	C	0.22UF	K	16V	C555	ECQE2335KF	P	3.3UF	K	200V
C154	ECJ2VF1H104Z	C	0.1UF	Z	50V	C561	ECWF2824HBB	PP	0.82UF	H	200V
C155	ECJ2VF1H104Z	C	0.1UF	Z	50V	C563	ECWF2364HBB	PP	0.36UF	H	200V
C163	ECUX1H151JCG	C	150PF	J	50V	C565	ECWF2154HBB	PP	0.15UF	H	200V
C164	ECUX1H151JCG	C	150PF	J	50V	C567	ECWF2185HBB	PP	1.8UF	H	200V
C166	ECUX1H151JCG	C	150PF	J	50V	C568	ECWF2154HBB	PP	0.15UF	H	200V
C167	ECUX1H151JCG	C	150PF	J	50V	C569	ECWF2154HBB	PP	0.15UF	H	200V
C168	ECUX1H151JCG	C	150PF	J	50V	C574	ECKD2H102KB5	C	1000PF	K	500V
C169	ECUX1C224KBX	C	0.22UF	K	16V	C575	ECKD2H102KB5	C	1000PF	K	500V
C170	ECUX1H151JCG	C	150PF	J	50V	C578	ECA1VHG470	E	47UF		35V
C171	ECEV1CG470G	E	47UF		16V	C590	ECUX1H103KBG	C	0.01UF	K	50V
C173	ECJ2VF1H104Z	C	0.1UF	Z	50V	C601	ECQF6102JZ	PP	1000PF	J	600V
C174	ECA1CHG471	E	470UF		16V	C602	ECQF6392JZ	PP	3900PF	J	600V
C179	ECJ2VF1H104Z	C	0.1UF	Z	50V	C651	ECEA1HGE4R7	E	4.7UF		50V
C183	ECJ2VF1H104Z	C	0.1UF	Z	50V	C652	ECA2EHG100	E	10UF		250V
C184	ECEV1CG100G	E	10UF		16V	C653	ECA2CHG100	E	10UF		160V
C185	ECJ2VF1H104Z	C	0.1UF	Z	50V	C654	ECA2CHG4R7	E	4.7UF		160V
C186	ECEV1CG100G	E	10UF		16V	C655	ECQV1H225JL	P	2.2UF	J	50V
C187	ECUX1H562JCW	C	5600PF	J	50V	C656	ECUX1H103KBG	C	0.01UF	K	50V
C188	ECUX1H562JUW	C	5600PF	J	50V	C657	ECUX1H103KBG	C	0.01UF	K	50V
C189	ECUX1H562JCW	C	5600PF	J	50V	C672	ECEA25V4R7T	E	4.7UF		25V

	Ref.No.	Part No.	Description				Ref.No.	Part No.	Description			
	C674	ECQV1H105JL	P	1UF	J	50V	C886	ECUX1H222KBN	C	2200PF	K	50V
	C675	ECQB1H104JF	P	0.1UF	J	50V	C887	ECUX1H681KBN	C	680PF	K	50V
	C682	ECJ2VF1H104Z	C	0.1UF	Z	50V	C888	TACBU2E333KT	C	0.033UF	K	250V
	C683	ECJ2VF1H104Z	C	0.1UF	Z	50V	C889	ECQE2684KF	P	0.68UF	K	200V
	C684	ECJ2VF1H104Z	C	0.1UF	Z	50V	C890	ECEA1HGE4R7	E	4.7UF		50V
	C706	ECA1EEN100	E	10UF		25V	C891	TAC1102A331T	E	330UF		100V
⚠	C801	ECQU2A334MVZ	PP	0.33UF	M	250V	C893	ECUX1H561JCX	C	560PF	J	50V
⚠	C804	ECKDRS472MEY	C	4700PF	M		C894	ECJ2VF1H104Z	C	0.1UF	Z	50V
⚠	C805	ECKDRS472MEY	C	4700PF	M		C896	ECUX1E104KBX	C	0.1UF	K	25V
⚠	C806	ECQU2A104MNF	PP	0.1UF	M	250V	C897	ECUX1H472KBM	C	4700PF	K	50V
⚠	C807	ECQU2A224MNF	PP	0.22UF	M	250V	C898	ECA2EHG470	E	47UF		250V
	C819	ECQE2154KF	P	0.15UF	K	200V	C899	ECUX1E104KBX	C	0.1UF	K	25V
	C820	ECUX1C105KBW	C	1UF	K	16V	C902	ECUX1H104ZFW	C	0.1UF	Z	50V
	C821	TAC1094Z391A	E	390UF		400V	C1001	ECUX1H103KBG	C	0.01UF	K	50V
	C822	ECQE2154KF	P	0.15UF	K	200V	C1002	TACCL0J227MT	E	220UF		6.3V
	C823	ECKD3A271KBP	C	270PF	K	1KV	C1003	ECUX1H103KBG	C	0.01UF	K	50V
	C825	ECEA1VGE330	E	33UF		35V	C1004	ECUX1H101JCG	C	100PF	J	50V
	C828	ECUX1H222KBN	C	2200PF	K	50V	C1011	ECUX1H103KBG	C	0.01UF	K	50V
⚠	C831	ECKDRS332MEY	C	3300PF	M		C1012	TACCL0J227MT	E	220UF		6.3V
⚠	C832	ECKDRS332MEY	C	3300PF	M		C1013	ECUX1H103KBG	C	0.01UF	K	50V
	C833	ECJ2VF1H104Z	C	0.1UF	Z	50V	C1014	ECUX1H101JCG	C	100PF	J	50V
	C834	ECUX1H222KBN	C	2200PF	K	50V	C1020	ECUX1H103KBG	C	0.01UF	K	50V
	C835	ECQB1H222JF	P	2200PF	J	50V	C1021	ECA1HEN4R7	E	4.7UF		50V
	C836	ECUX1H221KBN	C	220PF	K	50V	C1022	ECUX1H103KBG	C	0.01UF	K	50V
	C837	ECEA1HGE2R2	E	2.2UF		50V	C1030	ECUX1H103KBG	C	0.01UF	K	50V
	C839	ECUX1H222KBN	C	2200PF	K	50V	C1031	ECEA1EGE100	E	10UF		25V
	C841	ECEA1EGE101	E	100UF		25V	C1032	ECUX1H103KBG	C	0.01UF	K	50V
	C842	ECUX1H104ZFW	C	0.1UF	Z	50V	C1033	ECUX1H103KBG	C	0.01UF	K	50V
	C843	ECEA1EGE330	E	33UF		25V	C1034	ECJ2VF1C105Z	C	1UF	Z	16V
	C844	ECJ2VF1H104Z	C	0.1UF	Z	50V	C1041	ECUX1H680GCG	C	68PF	G	50V
	C845	ECEA1EGE100	E	10UF		25V	C1042	ECUX1H150GCN	C	15PF	G	50V
	C846	ECUX1H822KBG	C	8200PF	K	50V	C1043	ECUX1H040CCN	C	4PF	C	50V
	C848	ECEA1EGE330	E	33UF		25V	C1050	TACBN2A102KT	C	1000PF	K	100V
	C851	TACCC1C102MT	E	1000UF		16V	C1051	TACBN2A103KT	C	0.01UF	K	100V
	C852	ECQE1474KF	P	0.47UF	K	100V	C1052	ECEA2AGE100	E	10UF		100V
	C853	ECEA1CGE470	E	47UF		16V	C1053	TACBH2A474MT	C	0.47UF	M	100V
	C858	ECJ2VF1H104Z	C	0.1UF	Z	50V	C1055	TACBJ2H222KT	C	2200PF	K	500V
	C859	ECA2EHG101	E	100UF		250V	C1065	TACBG2E683KT	C	0.068UF	K	250V
	C860	TACBK2A224MT	C	0.22UF	M	100V	C1066	ECEA2CGE010	E	1UF		160V
	C861	ECOS2EA221CB	E	220UF		250V	C1067	ECUX1H470JCG	C	47PF	J	50V
	C862	TACCC2A471MB	E	470UF		100V	C1068	ECUX1H100CCN	C	10PF	C	50V
	C863	TAC11035102T	E	1000UF		35V	C1101	ECUX1H103KBG	C	0.01UF	K	50V
	C864	TACCC1E222MT	E	2200UF		25V	C1102	TACCL0J227MT	E	220UF		6.3V
	C865	ECEA1CGE102	E	1000UF		16V	C1103	ECUX1H103KBG	C	0.01UF	K	50V
	C866	ECEA1CGE102	E	1000UF		16V	C1104	ECUX1H101JCG	C	100PF	J	50V
	C867	TACBK2A224MT	C	0.22UF	M	100V	C1111	ECUX1H103KBG	C	0.01UF	K	50V
	C868	ECEA1EGE222	E	2200UF		25V	C1112	TACCL0J227MT	E	220UF		6.3V
	C869	ECA1CHG331	E	330UF		16V	C1113	ECUX1H103KBG	C	0.01UF	K	50V
	C870	ECA1CHG331	E	330UF		16V	C1114	ECUX1H101JCG	C	100PF	J	50V
	C872	ECUX1C224KBW	C	0.22UF	K	16V	C1120	ECUX1H103KBG	C	0.01UF	K	50V
	C874	ECA1HHG470	E	47UF		50V	C1121	ECA1HEN4R7	E	4.7UF		50V
	C875	TACCB2A331MA	E	330UF		100V	C1122	ECUX1H103KBG	C	0.01UF	K	50V
	C876	ECUX1H103KBG	C	0.01UF	K	50V	C1130	ECUX1H103KBG	C	0.01UF	K	50V
	C877	ECA1HHG220	E	22UF		50V	C1131	ECEA1EGE100	E	10UF		25V
	C878	ECA1CHG101	E	100UF		16V	C1132	ECUX1H103KBG	C	0.01UF	K	50V
	C879	ECA1EHG470	E	47UF		25V	C1133	ECUX1H103KBG	C	0.01UF	K	50V
	C880	ECEA1EGE220	E	22UF		25V	C1134	ECJ2VF1C105Z	C	1UF	Z	16V
	C881	ECA1HHG100	E	10UF		50V	C1141	ECUX1H680GCG	C	68PF	G	50V
	C882	ECEA1HGE100	E	10UF		50V	C1142	ECUX1H150GCN	C	15PF	G	50V
	C883	ECQB1H224JF	P	0.22UF	J	50V	C1143	ECUX1H030CCN	C	3PF	C	50V
	C884	ECUX1H102KBN	C	1000PF	K	50V	C1150	TACBN2A102KT	C	1000PF	K	100V
	C885	ECKD2H152KB5	C	1500PF	K	500V	C1151	TACBN2A103KT	C	0.01UF	K	100V

Ref.No.	Part No.	Description			
C1153	TACBH2A474MT	C	0.47UF	M	100V
C1155	TACBJ2H222KT	C	2200PF	K	500V
C1165	TACBG2E683KT	C	0.068UF	K	250V
C1166	ECEA2CGE010	E	1UF		160V
C1167	ECUX1H470JCG	C	47PF	J	50V
C1168	ECUX1H100CCN	C	10PF	C	50V
C1201	ECUX1H103KBG	C	0.01UF	K	50V
C1202	TACCL0J227MT	E	220UF		6.3V
C1203	ECUX1H103KBG	C	0.01UF	K	50V
C1204	ECUX1H101JCG	C	100PF	J	50V
C1211	ECUX1H103KBG	C	0.01UF	K	50V
C1212	TACCL0J227MT	E	220UF		6.3V
C1213	ECUX1H103KBG	C	0.01UF	K	50V
C1214	ECUX1H101JCG	C	100PF	J	50V
C1220	ECUX1H103KBG	C	0.01UF	K	50V
C1221	ECA1HEN4R7	E	4.7UF		50V
C1222	ECUX1H103KBG	C	0.01UF	K	50V
C1230	ECUX1H103KBG	C	0.01UF	K	50V
C1231	ECEA1EGE100	E	10UF		25V
C1232	ECUX1H103KBG	C	0.01UF	K	50V
C1233	ECUX1H103KBG	C	0.01UF	K	50V
C1234	ECJ2VF1C105Z	C	1UF	Z	16V
C1241	ECUX1H680GCG	C	68PF	G	50V
C1242	ECUX1H150GCN	C	15PF	G	50V
C1250	TACBN2A102KT	C	1000PF	K	100V
C1251	TACBN2A103KT	C	0.01UF	K	100V
C1252	ECEA2AGE100	E	10UF		100V
C1253	TACBH2A474MT	C	0.47UF	M	100V
C1255	TACBJ2H222KT	C	2200PF	K	500V
C1265	TACBG2E683KT	C	0.068UF	K	250V
C1266	ECEA2CGE010	E	1UF		160V
C1267	ECUX1H470JCG	C	47PF	J	50V
C1268	ECUX1H100CCN	C	10PF	C	50V
C1301	TACCL1C476MT	E	470UF		16V
C1302	TACCL1H105MT	E	1UF		50V
C1304	ECUX1H103KBG	C	0.01UF	K	50V
C1305	ECUX1H103KBG	C	0.01UF	K	50V
C1306	ECUX1H103KBG	C	0.01UF	K	50V
C1310	TACCL1C476MT	E	470UF		16V
C1312	TACCL1H105MT	E	1UF		50V
C1313	ECEA1HGE100	E	10UF		50V
C1314	ECJ2VF1H104Z	C	0.1UF	Z	50V
C1320	ECEA1CGE470	E	47UF		16V
C1321	ECUX1H103KBG	C	0.01UF	K	50V
C1322	ECA1HHG100	E	10UF		50V
C1323	ECUX1H103KBG	C	0.01UF	K	50V
C1326	ECEA1CGE471	E	470UF		16V
C1327	ECUX1H103KBG	C	0.01UF	K	50V
C1328	ECEA1CGE471	E	470UF		16V
C1329	ECEA1AGE101	E	100UF		10V
C1331	ECEA1AGE101	E	100UF		10V
C1332	ECJ2VF1E224Z	C	0.22UF	Z	25V
C1333	ECUX1H103KBG	C	0.01UF	K	50V
C1334	ECEA1CGE470	E	47UF		16V
C1335	ECEA1CGE470	E	47UF		16V
C1336	ECEA1CGE470	E	47UF		16V
C1340	TCUX1C225ZFN	C	2.2UF	Z	16V
C1342	ECEA2AGE220	E	22UF		100V
C1344	ECUX1H102KBN	C	1000PF	K	50V
C1345	ECJ2VF1H104Z	C	0.1UF	Z	50V
C1346	ECEA1EGE100	E	10UF		25V
C1348	ECEA2CGE100	E	10UF		160V

Ref.No.	Part No.	Description			
C1349	TCUX1C225ZFN	C	2.2UF	Z	16V
C1351	TACBJ2H222KT	C	2200PF	K	500V
C1355	TACBJ2H102KT	C	1000PF	K	500V
C1356	TACBJ2H101KT	C	100PF	K	500V
C1357	ECKD3D272KBP	C	2700PF	K	2KV
C1358	TACBJ2J222KT	C	2200PF	K	630V
C1359	TACBJ2J222KT	C	2200PF	K	630V
C1360	TACBJ2J222KT	C	2200PF	K	630V
C1365	TCUX2H110JCM	C	11PF	J	500V
C1370	TACBJ2H102KT	C	1000PF	K	500V
C1372	ECUX1H221KBN	C	220PF	K	50V
C1381	ECJ2VF1H104Z	C	0.1UF	Z	50V
C1391	TACBG2E683KT	C	0.068UF	K	250V
C1402	ECUX1H223KBX	C	0.022UF	K	50V
C1403	ECJ2VF1E224Z	C	0.22UF	Z	25V
C1404	ECUX1H221KBN	C	220PF	K	50V
C1405	ECUX1H104KBW	C	0.1UF	K	50V
C1406	ECEA1AGE101	E	100UF		10V
C1408	ECUX1H220JCN	C	22PF	J	50V
C1409	ECJ2VF1C105Z	C	1UF	Z	16V
C1410	ECEA1EGE100	E	10UF		25V
C1412	ECEA1HGE3R3	E	3.3UF		50V
C1414	ECEA1HGE3R3	E	3.3UF		50V
	RESISTORS				
C1353	ERJ8GCY0R00	M	0 OHM		1/8W
J601	ERJ6GEY0R00	M	0 OHM		1/10W
J602	ERJ6GEY0R00	M	0 OHM		1/10W
J603	ERJ6GEY0R00	M	0 OHM		1/10W
J604	ERJ6GEY0R00	M	0 OHM		1/10W
J605	ERJ6GEY0R00	M	0 OHM		1/10W
J606	ERJ6GEY0R00	M	0 OHM		1/10W
J607	ERJ6GEY0R00	M	0 OHM		1/10W
J608	ERJ6GEY0R00	M	0 OHM		1/10W
J609	ERJ6GEY0R00	M	0 OHM		1/10W
J610	ERJ6GEY0R00	M	0 OHM		1/10W
J701	ERJ8GCY0R00	M	0 OHM		1/8W
J702	ERJ8GCY0R00	M	0 OHM		1/8W
J703	ERJ8GCY0R00	M	0 OHM		1/8W
J704	ERJ8GCY0R00	M	0 OHM		1/8W
J705	ERJ8GCY0R00	M	0 OHM		1/8W
J706	ERJ8GCY0R00	M	0 OHM		1/8W
J707	ERJ8GCY0R00	M	0 OHM		1/8W
J708	ERJ8GCY0R00	M	0 OHM		1/8W
J709	ERJ8GCY0R00	M	0 OHM		1/8W
J710	ERJ8GCY0R00	M	0 OHM		1/8W
J712	ERJ8GCY0R00	M	0 OHM		1/8W
J713	ERJ8GCY0R00	M	0 OHM		1/8W
J714	ERJ8GCY0R00	M	0 OHM		1/8W
J715	ERJ8GCY0R00	M	0 OHM		1/8W
J716	ERJ8GCY0R00	M	0 OHM		1/8W
J717	ERJ8GCY0R00	M	0 OHM		1/8W
J718	ERJ8GCY0R00	M	0 OHM		1/8W
J719	ERJ8GCY0R00	M	0 OHM		1/8W
J721	ERJ8GCY0R00	M	0 OHM		1/8W
J722	ERJ8GCY0R00	M	0 OHM		1/8W
J724	ERJ8GCY0R00	M	0 OHM		1/8W
J725	ERJ8GCY0R00	M	0 OHM		1/8W
J726	ERJ8GCY0R00	M	0 OHM		1/8W
J727	ERJ8GCY0R00	M	0 OHM		1/8W
J729	ERJ8GCY0R00	M	0 OHM		1/8W
J730	ERJ8GCY0R00	M	0 OHM		1/8W

Ref.No.	Part No.	Description			
J731	ERJ8GCY0R00	M	0 OHM		1/8W
J732	ERJ8GCY0R00	M	0 OHM		1/8W
J733	ERJ8GCY0R00	M	0 OHM		1/8W
J734	ERJ8GCY0R00	M	0 OHM		1/8W
J735	ERJ8GCY0R00	M	0 OHM		1/8W
J736	ERJ8GCY0R00	M	0 OHM		1/8W
J737	ERJ8GCY0R00	M	0 OHM		1/8W
J738	ERJ8GCY0R00	M	0 OHM		1/8W
J739	ERJ8GCY0R00	M	0 OHM		1/8W
J1301	ERD25TC0	C	0 OHM		1/4W
J1302	ERD25TC0	C	0 OHM		1/4W
J1321	ERD25TC0	C	0 OHM		1/4W
J1325	ERJ6GEY0R00	M	0 OHM		1/10W
L1056	ERJ8GCY0R00	M	0 OHM		1/8W
L1156	ERJ8GCY0R00	M	0 OHM		1/8W
L1256	ERJ8GCY0R00	M	0 OHM		1/8W
R10	ERDS2TJ101	C	100 OHM	J	1/4W
R11	ERJ6ENF1002	M	10K OHM	F	1/10W
R12	ERJ6ENF4703	M	470K OHM	F	1/10W
R13	ERJ6ENF1052	M	10.5K OHM	F	1/10W
R14	ERJ6ENF3301	M	3.3K OHM	F	1/10W
R15	ERG2SJ183	M	18K OHM	J	2W
R16	ERJ6ENF2320	M	232 OHM	F	1/10W
R18	ERG1SJ273	M	27K OHM	J	1W
R19	ERJ6ENF4702	M	47K OHM	F	1/10W
R20	ERJ6ENF4702	M	47K OHM	F	1/10W
R22	ERJ6GEY0R00	M	0 OHM		1/10W
R23	ERJ6GEYJ105	M	1M OHM	J	1/10W
R24	ERJ6ENF4703	M	470K OHM	F	1/10W
R25	ERJ6ENF1000	M	100 OHM	F	1/10W
R26	ERJ6GEYJ333	M	33K OHM	J	1/10W
R31	ERJ6GEYJ102	M	1K OHM	J	1/10W
R32	ERJ8GCYK2R7	M	2.7 OHM	K	1/8W
R33	ERG1SJ100	M	10 OHM	J	1W
R50	ERJ6GEYJ102	M	1K OHM	J	1/10W
R51	ERJ6GEYJ102	M	1K OHM	J	1/10W
R52	ERJ6GEYJ102	M	1K OHM	J	1/10W
R53	ERJ6GEYJ102	M	1K OHM	J	1/10W
R55	ERJ6GEYJ102	M	1K OHM	J	1/10W
R56	ERJ6GEYJ102	M	1K OHM	J	1/10W
R58	ERJ6GEYJ102	M	1K OHM	J	1/10W
R101	ERJ6GEYJ103	M	10K OHM	J	1/10W
R102	ERJ6GEYJ103	M	10K OHM	J	1/10W
R103	ERJ6GEYJ103	M	10K OHM	J	1/10W
R104	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
R105	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
R106	ERJ6GEYJ103	M	10K OHM	J	1/10W
R107	ERJ6GEYJ103	M	10K OHM	J	1/10W
R109	ERJ6GEYJ103	M	10K OHM	J	1/10W
R110	ERJ6GEYJ103	M	10K OHM	J	1/10W
R111	ERJ6GEYJ152	M	1.5K OHM	J	1/10W
R112	ERJ6GEYJ122	M	1.2K OHM	J	1/10W
R115	ERJ6GEY0R00	M	0 OHM		1/10W
R120	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R121	ERJ6GEYJ822	M	8.2K OHM	J	1/10W
R123	ERJ6GEYJ122	M	1.2K OHM	J	1/10W
R124	ERJ6GEYJ392	M	3.9K OHM	J	1/10W
R125	ERJ6GEYJ335	M	3.3M OHM	J	1/10W
R127	ERJ6GEY0R00	M	0 OHM		1/10W
R131	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R132	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R133	ERJ6GEY0R00	M	0 OHM		1/10W
R134	ERJ6GEY0R00	M	0 OHM		1/10W
R135	ERJ6GEYJ471	M	470 OHM	J	1/10W
R136	ERJ6GEYJ470	M	47 OHM	J	1/10W
R137	ERJ6GEYJ470	M	47 OHM	J	1/10W
R140	ERJ6GEYJ103	M	10K OHM	J	1/10W
R141	ERJ6GEYJ103	M	10K OHM	J	1/10W
R142	ERJ6GEYJ103	M	10K OHM	J	1/10W
R145	ERJ6GEYJ103	M	10K OHM	J	1/10W
R146	ERJ6GEYJ103	M	10K OHM	J	1/10W
R149	ERJ6GEYJ183	M	18K OHM	J	1/10W
R150	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
R151	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
R152	ERJ12YJ471	M	470 OHM	J	1/2W
R153	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
R154	ERJ6GEYJ102	M	1K OHM	J	1/10W
R155	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R156	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R162	ERJ6GEYJ152	M	1.5K OHM	J	1/10W
R163	ERJ6GEYJ683	M	68K OHM	J	1/10W
R164	ERJ6GEYJ102	M	1K OHM	J	1/10W
R165	ERJ6GEY0R00	M	0 OHM		1/10W
R170	ERJ6ENF2202	M	22K OHM	F	1/10W
R171	ERJ6ENF5622	M	56.2K OHM	F	1/10W
R172	ERJ6ENF5622	M	56.2K OHM	F	1/10W
R173	ERJ6ENF6802	M	68K OHM	F	1/10W
R174	ERJ6GEYJ270	M	27 OHM	J	1/10W
R175	ERJ6GEYJ270	M	27 OHM	J	1/10W
R177	ERJ6GEY0R00	M	0 OHM		1/10W
R191	ERJ6GEYJ271	M	270 OHM	J	1/10W
R192	ERJ6GEYJ271	M	270 OHM	J	1/10W
R193	ERJ6GEYJ471	M	470 OHM	J	1/10W
R194	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
R195	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
R196	ERJ6GEYJ471	M	470 OHM	J	1/10W
R197	ERJ6GEYJ103	M	10K OHM	J	1/10W
R200	ERJ6GEYJ471	M	470 OHM	J	1/10W
R201	ERJ6GEYJ101	M	100 OHM	J	1/10W
R204	ERJ6GEYJ471	M	470 OHM	J	1/10W
R205	ERJ6GEYJ101	M	100 OHM	J	1/10W
R208	ERJ6GEYJ471	M	470 OHM	J	1/10W
R209	ERJ6GEYJ471	M	470 OHM	J	1/10W
R210	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
R213	ERJ6GEY0R00	M	0 OHM		1/10W
R214	ERJ6GEY0R00	M	0 OHM		1/10W
R220	ERJ6GEY0R00	M	0 OHM		1/10W
R221	ERJ6GEY0R00	M	0 OHM		1/10W
R222	ERJ6GEYJ103	M	10K OHM	J	1/10W
R223	ERJ6GEYJ123	M	12K OHM	J	1/10W
R224	ERJ6GEYJ563	M	56K OHM	J	1/10W
R240	ERJ6GEYJ271	M	270 OHM	J	1/10W
R241	ERJ6GEYJ271	M	270 OHM	J	1/10W
R242	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
R243	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
R250	ERJ6GEY0R00	M	0 OHM		1/10W
R255	ERJ6GEYJ272	M	2.7K OHM	J	1/10W
R256	ERJ6GEYJ121	M	120 OHM	J	1/10W
R257	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
R258	ERJ6GEYJ561	M	560 OHM	J	1/10W
R261	ERJ6GEYJ683	M	68K OHM	J	1/10W
R271	ERJ6GEYJ223	M	22K OHM	J	1/10W
R272	ERJ6GEYJ223	M	22K OHM	J	1/10W
R273	ERJ6GEYJ102	M	1K OHM	J	1/10W

Ref.No.	Part No.	Description				
R274	ERJ6GEYJ102	M	1K	OHM	J	1/10W
R280	ERJ6GEYJ152	M	1.5K	OHM	J	1/10W
R281	ERJ6GEYJ104	M	100K	OHM	J	1/10W
R282	ERJ6GEYJ102	M	1K	OHM	J	1/10W
R283	ERJ6GEYJ331	M	330	OHM	J	1/10W
R284	ERJ6GEYJ331	M	330	OHM	J	1/10W
R285	ERJ6GEYJ102	M	1K	OHM	J	1/10W
R286	ERJ6GEYJ561	M	560	OHM	J	1/10W
R291	ERJ6GEYJ223	M	22K	OHM	J	1/10W
R292	ERJ6GEYJ223	M	22K	OHM	J	1/10W
R293	ERJ6GEYJ102	M	1K	OHM	J	1/10W
R294	ERJ6GEYJ102	M	1K	OHM	J	1/10W
R350	ERQ14AJ330	F	33	OHM	J	1/4W
R353	ERDS1FJ100	C	10	OHM	J	1/2W
R354	ERDS1FJ100	C	10	OHM	J	1/2W
R355	ERG2SJ270	M	27	OHM	J	2W
R371	ERDS1FJ364	C	360K	OHM	J	1/2W
R372	ERJ8GCYJ475	M	4.7M	OHM	J	1/8W
R373	ERJ8GCYJ683	M	68K	OHM	J	1/8W
R374	ERJ8ENF1101	M	1.1K	OHM	F	1/8W
R375	ERJ6GEYJ472	M	4.7K	OHM	J	1/10W
R380	ERD25FJ102K	C	1K	OHM	J	1/4W
R381	ERJ6ENF2051	M	2.05K	OHM	F	1/10W
R382	ERJ6ENF6982	M	69.8K	OHM	F	1/10W
R384	ERJ6ENF2871	M	2.87K	OHM	F	1/10W
R385	ERJ8GCYJ121	M	120	OHM	J	1/8W
R386	ERG3FJ103	M	10K	OHM	J	3W
R387	ERJ8GCYJ302	M	3K	OHM	J	1/8W
R389	ERJ8GCYJ102	M	1K	OHM	J	1/8W
R390	ERJ6ENF1071	M	1.07K	OHM	F	1/10W
R391	ERJ6GEYJ103	M	10K	OHM	J	1/10W
R392	ERJ6GEYJ562	M	5.6K	OHM	J	1/10W
R393	ERG1SJ273	M	27K	OHM	J	1W
R407	ERJ6ENF2432	M	24.3K	OHM	F	1/10W
R425	ERDS2TJ222	C	2.2K	OHM	J	1/4W
R440	ERJ6GEYJ103	M	10K	OHM	J	1/10W
R441	ERJ6GEYJ103	M	10K	OHM	J	1/10W
R480	ERJ6ENF1742	M	17.4K	OHM	F	1/10W
R481	ERJ6ENF2941	M	2.94K	OHM	F	1/10W
R482	ERDS1FJ1R2	C	1.2	OHM	J	1/2W
R483	ERDS1FJ1R2	C	1.2	OHM	J	1/2W
R484	EROS2CKF1202	M	12K	OHM	F	1/4W
R485	ERJ6GEYJ122	M	1.2K	OHM	J	1/10W
R486	ERJ6ENF1872	M	18.7K	OHM	F	1/10W
R487	ERDS2TJ1R0	C	1	OHM	J	1/4W
R488	ERX1SG1R2	M	1.2	OHM	G	1W
R489	ERX1SG1R8	M	1.8	OHM	G	1W
R501	ERX2SJ3R3	M	3.3	OHM	J	2W
R502	ERG1SJ390	M	39	OHM	J	1W
R503	ERJ6GEYJ472	M	4.7K	OHM	J	1/10W
R504	ERJ6GEYJ153	M	15K	OHM	J	1/10W
R505	ERX2SJ3R3	M	3.3	OHM	J	2W
R506	ERD25FJ153K	C	15K	OHM	J	1/4W
R507	ERJ6GEYJ392	M	3.9K	OHM	J	1/10W
R508	ERJ6GEYJ102	M	1K	OHM	J	1/10W
R509	ERJ6GEYJ472	M	4.7K	OHM	J	1/10W
R527	ERJ6GEY0R00	M	0	OHM		1/10W
R530	ERQ12AJ270	F	27	OHM	J	1/2W
R531	ERJ12YJ5R6	M	5.6	OHM	J	1/2W
R532	ERJ12YJ5R6	M	5.6	OHM	J	1/2W
R542	ERJ6ENF7871	M	7.87K	OHM	F	1/10W
R543	ERJ6ENF6491	M	6.49K	OHM	F	1/10W
R544	ERJ6ENF1822	M	18.2K	OHM	F	1/10W
R545	ERG3FJ470	M	47	OHM	J	3W
R546	ERG3FJ470	M	47	OHM	J	3W
R547	ERJ6GEYJ470	M	47	OHM	J	1/10W
R548	ERJ6GEYJ332	M	3.3K	OHM	J	1/10W
R549	ERG2SJ561	M	560	OHM	J	2W
R550	ERQ12AJR47	F	0.47	OHM	J	1/2W
R551	ERX3FJX1R8D	M	1.8	OHM	J	3W
R552	ERX3FJX1R8D	M	1.8	OHM	J	3W
R554	ERX3FJX6R8D	M	6.8	OHM	J	3W
R555	ERD25TC0	C	0	OHM		1/4W
R560	ERJ6GEYJ472	M	4.7K	OHM	J	1/10W
R561	ERJ6GEYJ100	M	10	OHM	J	1/10W
R563	ERJ6GEYJ472	M	4.7K	OHM	J	1/10W
R564	ERJ6GEYJ100	M	10	OHM	J	1/10W
R566	ERJ6GEYJ472	M	4.7K	OHM	J	1/10W
R567	ERJ6GEYJ100	M	10	OHM	J	1/10W
R568	ERJ6GEYJ472	M	4.7K	OHM	J	1/10W
R569	ERJ6GEYJ100	M	10	OHM	J	1/10W
R574	ERDS1FJ181	C	180	OHM	J	1/2W
R575	ERQ12AJ271	F	270	OHM	J	1/2W
R595	ERJ6GEYJ562	M	5.6K	OHM	J	1/10W
R596	ERJ6GEYJ562	M	5.6K	OHM	J	1/10W
R597	ERJ6GEYJ562	M	5.6K	OHM	J	1/10W
R602	ERX1SJR33	M	0.33	OHM	J	1W
R603	ERX1SJR27	M	0.27	OHM	J	1W
R604	TARRS5B101J2	M	100	OHM	J	5W
R605	TARRS5B101J2	M	100	OHM	J	5W
R648	ERJ6ENF8060	M	806	OHM	F	1/10W
R649	ERJ6GEY0R00	M	0	OHM		1/10W
R650	ERJ8GCY0R00	M	0	OHM		1/8W
R651	ERQ14AJ100	F	10	OHM	J	1/4W
R652	ERQ14AJR47HK	F	0.47	OHM	J	1/4W
R653	ERQ14AJR47HK	F	0.47	OHM	J	1/4W
R655	ERJ8ENF5231	M	5.23K	OHM	F	1/8W
R656	ERJ6GEYJ223	M	22K	OHM	J	1/10W
R657	ERJ6ENF3162	M	31.6K	OHM	F	1/10W
R658	ERJ6ENF1002	M	10K	OHM	F	1/10W
R660	ERJ6GEYJ270	M	27	OHM	J	1/10W
R671	EROS2CKF1333	M	133K	OHM	F	1/4W
R672	EROS2CKF1433	M	143K	OHM	F	1/4W
R673	ERDS2TJ474	C	470K	OHM	J	1/4W
R680	ERJ6GEYJ153	M	15K	OHM	J	1/10W
R682	ERJ6GEYJ221	M	220	OHM	J	1/10W
R683	ERJ6GEYJ562	M	5.6K	OHM	J	1/10W
R684	ERJ6ENF1002	M	10K	OHM	F	1/10W
R685	ERJ6ENF2372	M	23.7K	OHM	F	1/10W
R687	ERJ6GEYJ333	M	33K	OHM	J	1/10W
R720	ERJ6GEYJ682	M	6.8K	OHM	J	1/10W
R721	ERJ6GEYJ164	M	160K	OHM	J	1/10W
R722	ERJ6GEYJ182	M	1.8K	OHM	J	1/10W
R801	ERC12AGK105	S	1M	OHM	K	1/2W
R820	ERJ6GEYJ563	M	56K	OHM	J	1/10W
R821	ERF2EKR22	W	0.22	OHM	K	2W
R822	TARRS3B104J2	M	100K	OHM	J	3W
R823	ERJ6GEYJ103	M	10K	OHM	J	1/10W
R824	ERJ6ENF1211	M	1.21K	OHM	F	1/10W
R825	ERJ6GEYJ682	M	6.8K	OHM	J	1/10W
R826	ERJ6ENF7152	M	71.5K	OHM	F	1/10W
R827	ERDS1FJ394	C	390K	OHM	J	1/2W
R828	ERDS1FJ394	C	390K	OHM	J	1/2W
R829	ERJ8GCYJ223	M	22K	OHM	J	1/8W

Ref.No.	Part No.	Description	Ref.No.	Part No.	Description
R830	ERJ6GEYJ273	M 27K OHM J 1/10W	R898	ERJ6ENF2001	M 2K OHM F 1/10W
R831	ERD25FJ560K	C 56 OHM J 1/4W	R899	ERJ6GEYJ103	M 10K OHM J 1/10W
R832	ERJ6GEYJ220	M 22 OHM J 1/10W	R902	ERJ6GEYJ103	M 10K OHM J 1/10W
R833	ERD25FJ223K	C 22K OHM J 1/4W	R903	ERJ6GEYJ102	M 1K OHM J 1/10W
R834	ERJ8GCYJ222	M 2.2K OHM J 1/8W	R905	ERJ6GEYJ331	M 330 OHM J 1/10W
R835	ERJ8GCYJ222	M 2.2K OHM J 1/8W	R906	ERJ6GEYJ331	M 330 OHM J 1/10W
R836	ERG3FJ820	M 82 OHM J 3W	R909	ERJ6GEYJ562	M 5.6K OHM J 1/10W
R837	ERJ6ENF1400	M 140 OHM F 1/10W	R913	ERJ6GEYJ562	M 5.6K OHM J 1/10W
R838	ERJ6GEYJ222	M 2.2K OHM J 1/10W	R961	ERJ6GEY0R00	M 0 OHM 1/10W
R839	ERJ6GEYJ332	M 3.3K OHM J 1/10W	R975	ERJ6GEYJ101	M 100 OHM J 1/10W
R840	ERJ6GEYJ103	M 10K OHM J 1/10W	R978	ERJ6GEYJ101	M 100 OHM J 1/10W
R841	ERDS1FJ104	C 100K OHM J 1/2W	R979	ERJ6GEYJ101	M 100 OHM J 1/10W
R842	ERJ6GEYJ180	M 18 OHM J 1/10W	R988	ERJ6GEYJ102	M 1K OHM J 1/10W
R843	ERJ6GEYJ103	M 10K OHM J 1/10W	R990	ERDS2TJ103	C 10K OHM J 1/4W
R847	ERJ6GEYK2R2	M 2.2 OHM K 1/10W	R991	ERDS2TJ103	C 10K OHM J 1/4W
R849	ERDS2TJ122	C 1.2K OHM J 1/4W	R992	ERJ6GEY0R00	M 0 OHM 1/10W
R850	ERJ6GEYJ102	M 1K OHM J 1/10W	R993	ERJ6GEY0R00	M 0 OHM 1/10W
R853	ERJ6GEYJ271	M 270 OHM J 1/10W	R1001	TAJADQ76R8FV	M 76.8 OHM F 1/3W
R854	ERJ6GEYJ820	M 82 OHM J 1/10W	R1002	ERJ6GEYJ223	M 22K OHM J 1/10W
R855	ERJ6GEYJ102	M 1K OHM J 1/10W	R1003	ERJ6GEYJ123	M 12K OHM J 1/10W
R856	ERA6YEB104	M 100K OHM B 1/10W	R1004	ERJ6ENF3900	M 390 OHM F 1/10W
R857	ERA6YEB302	M 3K OHM B 1/10W	R1007	ERJ6ENF11R5	M 11.5 OHM F 1/10W
R858	ERJ6GEYJ102	M 1K OHM J 1/10W	R1011	TAJADQ76R8FV	M 76.8 OHM F 1/3W
R859	ERD25FJ391K	C 390 OHM J 1/4W	R1012	ERJ6GEYJ223	M 22K OHM J 1/10W
R860	ERJ6GEYJ103	M 10K OHM J 1/10W	R1013	ERJ6GEYJ123	M 12K OHM J 1/10W
R861	ERQ12AJR33HK	F 0.33 OHM J 1/2W	R1014	ERJ6ENF3900	M 390 OHM F 1/10W
R862	TAR14CJ0R15V	M 0.15 OHM J 1/2W	R1020	TAJADQ75R0FV	M 75 OHM F 1/3W
R863	ERQ12AJR47	F 0.47 OHM J 1/2W	R1021	ERJ6GEYJ330	M 33 OHM J 1/10W
R864	ERQ12AJR12HK	F 0.12 OHM J 1/2W	R1022	ERJ8GCYJ471	M 470 OHM J 1/8W
R865	ERQ12AJR12HK	F 0.12 OHM J 1/2W	R1023	ERJ6GEYJ330	M 33 OHM J 1/10W
R866	ERQ12AJR12HK	F 0.12 OHM J 1/2W	R1030	ERJ6GEYJ330	M 33 OHM J 1/10W
R867	ERJ6GEYJ104	M 100K OHM J 1/10W	R1031	ERJ6GEYJ331	M 330 OHM J 1/10W
R868	ERQ12AJR47	F 0.47 OHM J 1/2W	R1032	ERJ6GEYJ100	M 10 OHM J 1/10W
R869	ERD25FJ471K	C 470 OHM J 1/4W	R1033	ERJ6GEYJ330	M 33 OHM J 1/10W
R870	ERDS1FJ224	C 220K OHM J 1/2W	R1040	ERJ6ENF2260	M 226 OHM F 1/10W
R871	ERJ6GEYJ183	M 18K OHM J 1/10W	R1041	ERJ6ENF29R4	M 29.4 OHM F 1/10W
R872	ERJ6ENF1822	M 18.2K OHM F 1/10W	R1042	ERJ6GEYJ682	M 6.8K OHM J 1/10W
R873	ERJ6ENF4222	M 42.2K OHM F 1/10W	R1044	ERJ6ENF1581	M 1.58K OHM F 1/10W
R874	ERJ6GEYJ101	M 100 OHM J 1/10W	R1050	ERJ6ENF1053	M 105K OHM F 1/10W
R875	ERJ6GEYJ102	M 1K OHM J 1/10W	R1052	ERJ6GEY0R00	M 0 OHM 1/10W
R876	ERJ6GEYJ562	M 5.6K OHM J 1/10W	R1055	ERDS2TJ471	C 470 OHM J 1/4W
R877	ERJ6GEYJ753	M 75K OHM J 1/10W	R1057	ERDS1FJ330	C 33 OHM J 1/2W
R878	ERG1SJ683	M 68K OHM J 1W	R1061	ERJ6ENF2372	M 23.7K OHM F 1/10W
R879	ERJ8GCYJ332	M 3.3K OHM J 1/8W	R1062	ERJ6ENF4532	M 45.3K OHM F 1/10W
R880	EROS2CKF1211	M 1.21K OHM F 1/4W	R1065	ERJ6GEYJ221	M 220 OHM J 1/10W
R881	ERJ6ENF1821	M 1.82K OHM F 1/10W	R1066	ERJ6GEYJ103	M 10K OHM J 1/10W
R882	ERJ6ENF4531	M 4.53K OHM F 1/10W	R1067	ERDS2TJ224	C 220K OHM J 1/4W
R883	ERJ6GEYJ103	M 10K OHM J 1/10W	R1101	TAJADQ76R8FV	M 76.8 OHM F 1/3W
R884	ERJ6ENF6041	M 6.04K OHM F 1/10W	R1102	ERJ6GEYJ223	M 22K OHM J 1/10W
R885	ERJ6ENF3741	M 3.74K OHM F 1/10W	R1103	ERJ6GEYJ123	M 12K OHM J 1/10W
R886	ERJ6GEYJ103	M 10K OHM J 1/10W	R1104	ERJ6ENF1400	M 140 OHM F 1/10W
R887	ERJ6GEYJ103	M 10K OHM J 1/10W	R1107	ERJ6ENF11R5	M 11.5 OHM F 1/10W
R888	ERJ6GEYJ103	M 10K OHM J 1/10W	R1111	TAJADQ76R8FV	M 76.8 OHM F 1/3W
R889	ERJ6GEYJ391	M 390 OHM J 1/10W	R1112	ERJ6GEYJ223	M 22K OHM J 1/10W
R890	ERX2SJ1R0	M 1 OHM J 2W	R1113	ERJ6GEYJ123	M 12K OHM J 1/10W
R891	ERJ6GEYJ103	M 10K OHM J 1/10W	R1114	ERJ6ENF1400	M 140 OHM F 1/10W
R892	ERJ6ENF4420	M 442 OHM F 1/10W	R1120	TAJADQ75R0FV	M 75 OHM F 1/3W
R893	ERDS1FJ224	C 220K OHM J 1/2W	R1121	ERJ6GEYJ330	M 33 OHM J 1/10W
R894	ERJ6GEYJ102	M 1K OHM J 1/10W	R1122	ERJ8GCYJ471	M 470 OHM J 1/8W
R895	ERJ6GEYJ101	M 100 OHM J 1/10W	R1123	ERJ6GEYJ330	M 33 OHM J 1/10W
R896	ERJ6GEYJ332	M 3.3K OHM J 1/10W	R1130	ERJ6GEYJ330	M 33 OHM J 1/10W
R897	ERJ6GEYJ225	M 2.2M OHM J 1/10W	R1131	ERJ6GEYJ331	M 330 OHM J 1/10W

	Ref.No.	Part No.	Description			
	R1132	ERJ6GEYJ100	M	10 OHM	J	1/10W
	R1133	ERJ6GEYJ330	M	33 OHM	J	1/10W
	R1140	ERJ6ENF2260	M	226 OHM	F	1/10W
	R1141	ERJ6ENF26R7	M	26.7 OHM	F	1/10W
	R1142	ERJ6GEYJ682	M	6.8K OHM	J	1/10W
	R1144	ERJ6ENF1581	M	1.58K OHM	F	1/10W
	R1150	ERJ6ENF1053	M	105K OHM	F	1/10W
	R1152	ERJ6GEYOROO	M	O OHM		1/10W
	R1155	ERDS2TJ471	C	470 OHM	J	1/4W
	R1157	ERDS1FJ330	C	33 OHM	J	1/2W
	R1161	ERJ6ENF2372	M	23.7K OHM	F	1/10W
	R1162	ERJ6ENF4532	M	45.3K OHM	F	1/10W
	R1165	ERJ6GEYJ221	M	220 OHM	J	1/10W
	R1166	ERJ6GEYJ103	M	10K OHM	J	1/10W
	R1167	ERDS2TJ224	C	220K OHM	J	1/4W
	R1201	TAJADQ76R8FV	M	76.8 OHM	F	1/3W
	R1202	ERJ6GEYJ223	M	22K OHM	J	1/10W
	R1203	ERJ6GEYJ123	M	12K OHM	J	1/10W
	R1204	ERJ6ENF3900	M	390 OHM	F	1/10W
	R1207	ERJ6ENF11R5	M	11.5 OHM	F	1/10W
	R1211	TAJADQ76R8FV	M	76.8 OHM	F	1/3W
	R1212	ERJ6GEYJ223	M	22K OHM	J	1/10W
	R1213	ERJ6GEYJ123	M	12K OHM	J	1/10W
	R1214	ERJ6ENF3900	M	390 OHM	F	1/10W
	R1220	TAJADQ75ROFV	M	75 OHM	F	1/3W
	R1221	ERJ6GEYJ330	M	33 OHM	J	1/10W
	R1222	ERJ8GCYJ471	M	470 OHM	J	1/8W
	R1223	ERJ6GEYJ330	M	33 OHM	J	1/10W
	R1230	ERJ6GEYJ330	M	33 OHM	J	1/10W
	R1231	ERJ6GEYJ331	M	330 OHM	J	1/10W
	R1232	ERJ6GEYJ100	M	10 OHM	J	1/10W
	R1233	ERJ6GEYJ330	M	33 OHM	J	1/10W
	R1240	ERJ6ENF2260	M	226 OHM	F	1/10W
	R1241	ERJ6ENF30R1	M	30.1 OHM	F	1/10W
	R1242	ERJ6GEYJ682	M	6.8K OHM	J	1/10W
	R1244	ERJ6ENF1581	M	1.58K OHM	F	1/10W
	R1250	ERJ6ENF1053	M	105K OHM	F	1/10W
	R1252	ERJ6GEYOROO	M	O OHM		1/10W
	R1255	ERDS2TJ471	C	470 OHM	J	1/4W
	R1257	ERDS1FJ330	C	33 OHM	J	1/2W
	R1261	ERJ6ENF2372	M	23.7K OHM	F	1/10W
	R1262	ERJ6ENF4532	M	45.3K OHM	F	1/10W
	R1265	ERJ6GEYJ221	M	220 OHM	J	1/10W
	R1266	ERJ6GEYJ103	M	10K OHM	J	1/10W
	R1267	ERDS2TJ224	C	220K OHM	J	1/4W
	R1301	ERJ6GEYJ103	M	10K OHM	J	1/10W
	R1302	ERJ6GEYJ103	M	10K OHM	J	1/10W
	R1303	ERJ6GEYJ103	M	10K OHM	J	1/10W
	R1304	ERJ6GEYJ103	M	10K OHM	J	1/10W
	R1320	ERJ6GEYJ101	M	100 OHM	J	1/10W
	R1321	ERJ6GEYJ101	M	100 OHM	J	1/10W
	R1322	ERJ6GEYJ101	M	100 OHM	J	1/10W
	R1325	ERJ6ENF2372	M	23.7K OHM	F	1/10W
	R1326	ERJ6ENF4641	M	4.64K OHM	F	1/10W
	R1327	ERJ6GEYJ470	M	47 OHM	J	1/10W
	R1330	ERJ6GEYJ102	M	1K OHM	J	1/10W
	R1331	ERJ6GEYJ683	M	68K OHM	J	1/10W
	R1332	ERJ6GEYOROO	M	O OHM		1/10W
	R1333	ERJ6ENF7501	M	7.5K OHM	F	1/10W
	R1334	ERJ6ENF1002	M	10K OHM	F	1/10W
	R1335	ERJ6GEYJ562	M	5.6K OHM	J	1/10W
	R1336	ERJ6GEYJ223	M	22K OHM	J	1/10W
	R1338	ERJ6GEYJ123	M	12K OHM	J	1/10W
	R1339	ERJ6GEYJ183	M	18K OHM	J	1/10W
	R1340	ERJ6GEYJ331	M	330 OHM	J	1/10W
	R1341	ERDS1FJ682	C	6.8K OHM	J	1/2W
	R1343	ERQ14AJR47HK	F	0.47 OHM	J	1/4W
	R1345	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
	R1346	ERDS1FJ561	C	560 OHM	J	1/2W
	R1347	ERJ6ENF1241	M	1.24K OHM	F	1/10W
	R1348	ERJ6ENF1002	M	10K OHM	F	1/10W
	R1355	ERDS1FJ680	C	68 OHM	J	1/2W
	R1360	ERJ6GEYJ222	M	2.2K OHM	J	1/10W
	R1361	ERJ6GEYJ563	M	56K OHM	J	1/10W
	R1362	ERJ6GEYJ102	M	1K OHM	J	1/10W
	R1364	ERJ6ENF6192	M	61.9K OHM	F	1/10W
	R1365	EROS2CKF1004	M	1M OHM	F	1/4W
	R1366	ERJ6GEYJ103	M	10K OHM	J	1/10W
	R1370	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
	R1371	ERJ6GEYJ682	M	6.8K OHM	J	1/10W
	R1372	ERJ6GEYJ332	M	3.3K OHM	J	1/10W
	R1373	ERJ6GEYJ682	M	6.8K OHM	J	1/10W
	R1374	ERJ6GEYJ153	M	15K OHM	J	1/10W
	R1391	ERDS1FJ125	C	1.2M OHM	J	1/2W
	R1392	ERJ6GEYJ472	M	4.7K OHM	J	1/10W
	R1393	ERJ6GEYJ152	M	1.5K OHM	J	1/10W
	R1394	ERJ6GEYJ392	M	3.9K OHM	J	1/10W
	R1395	ERJ6GEYJ102	M	1K OHM	J	1/10W
	R1396	ERDS1FJ224	C	220K OHM	J	1/2W
	R1401	ERJ6GEYJ330	M	33 OHM	J	1/10W
	R1402	ERJ6GEYJ562	M	5.6K OHM	J	1/10W
	R1403	ERJ6GEYJ561	M	560 OHM	J	1/10W
	R1404	ERJ6GEYJ182	M	1.8K OHM	J	1/10W
	R1405	ERJ6GEYJ105	M	1M OHM	J	1/10W
	R1412	ERJ6GEYJ101	M	100 OHM	J	1/10W
	R1413	ERJ6GEYJ101	M	100 OHM	J	1/10W
	R1414	ERJ6GEYJ102	M	1K OHM	J	1/10W
	R1415	ERJ6GEYJ102	M	1K OHM	J	1/10W
		OTHERS				
		TESA027	CRT PCB HOLDER			
		THEC0159	SCREW(FOR CRT PCB HOLDER)			
		THE902N	D-SUB SCREW			
		THTF001	SCREW(FOR IC/TR/D)			
		TMKK027	DOUBLE FACE TAPE			
⚠		TMMK030	INSULATION TUBE			
⚠		TMM81417-1	CORD BAND (BIG)			
		TSC8908-0	FERRITE CORE			
		TSXF134	PHONO PIN CABLE(GREY)			
		TSXF135	PHONO PIN CABLE(RED)			
		TSXF136	PHONO PIN CABLE(BLUE)			
		TUCC5095-1	AC SOCKET BRACKET			
		TUCC5270	SHIELD CASE(CRT PCB)			
		TUCC5271	SHIELD PLATE(CRT PCB)			
		TUWF034	BNC TERMINAL BRACKET			
		XTV3+10J	SCREW			
		XYE3+EJ10	SCREW			
⚠	CL1	TMM85490	LEAD CLAMPER			
	CL2	TUXX104	WIRE CLIP			
⚠	F801	XBA2C50TB15L	FUSE(5.0A)			
	F851	TSFX37A632	FUSE(6.3A)			
	FG1	TJC85341	EARTH LUG			
	FG2	TJC85341	EARTH LUG			
	FG3	TJC85341	EARTH LUG			

	Ref.No.	Part No.	Description
	FG4	TJC85341	EARTH LUG
	FG5	TJC85341	EARTH LUG
	FG6	TJC85341	EARTH LUG
	FG7	TJC85341	EARTH LUG
	FG8	TJC85341	EARTH LUG
	FG9	TJC85341	EARTH LUG
	FG10	TJC85341	EARTH LUG
	FG11	TJC85341	EARTH LUG
	FG101	TJC85341	EARTH LUG
	FG102	TJC85341	EARTH LUG
	FG103	TJC85341	EARTH LUG
	FS801	TJC85502T	FUSE HOLDER
	FS802	TJC85502T	FUSE HOLDER
⚠	N11	EMCS0464M	4P CONNECTOR
⚠	N12-	TSXX082	2P/3P CONNECTOR ASSY
⚠	N22A	TJSF07805	5P CONNECTOR
⚠	N22B	TJSF16305	5P CONNECTOR
⚠	N100A	TJSF07820	20P CONNECTOR
⚠	N100B	TJSF16320	20P CONNECTOR(L-TYPE)
⚠	N101	TJS118590	2P CONNECTOR
⚠	N150A	TJSF08012	12P CONNECTOR
⚠	N150B	TJSF07912	12P CONNECTOR(L-TYPE)
⚠	N231	TJSF10400	BNC TERMINAL
⚠	N232	TJSF10400	BNC TERMINAL
	N490	TJEA022	HEAT SINK TERMINAL
	N651	TJC85342T	LUG TERMINAL
	N652	TJCD003	TERMINAL
⚠	N801	TJS8A9361	AC SOCKET
⚠	N861	EMCS0264M	2P CONNECTOR
	N891	TEL302-9	TERMINAL
	N893	TEL302-9	TERMINAL
⚠	N903	EMCS0451ML	4P CONNECTOR(L-TYPE)
⚠	N1001	TJSF10400	BNC TERMINAL
	N1002A	TJS8A4291	PHONO PIN CONNECTOR
	N1002B	TJS8A4291	PHONO PIN CONNECTOR
⚠	N1004	TJSC00600	CRT SOCKET
	N1005	TJC85342T	LUG TERMINAL
	N1006	TJCD003	TERMINAL
⚠	N1007-	TSXX054	1P/2P CONNECTOR ASSY
⚠	N1011	TJSF26615	15P CONNECTOR(D-SUB)
⚠	N1015A	TJSF09554	54P CONNECTOR
⚠	N1101	TJSF10400	BNC TERMINAL
	N1102A	TJS8A4291	PHONO PIN CONNECTOR
	N1102B	TJS8A4291	PHONO PIN CONNECTOR
⚠	N1201	TJSF10400	BNC TERMINAL
	N1202A	TJS8A4291	PHONO PIN CONNECTOR
	N1202B	TJS8A4291	PHONO PIN CONNECTOR
	N510-1	TEL302-9	TERMINAL
	N510-2	TEL302-9	TERMINAL
	N510-3	TEL302-9	TERMINAL
	N510-4	TEL302-9	TERMINAL
	N901-1	TEL302-9	TERMINAL
	N901-2	TEL302-9	TERMINAL
⚠	PC821	ON3171	PHOTO COUPLER
⚠	PC822	ON3171	PHOTO COUPLER
⚠	PC823	HCNW4504	PHOTO COUPLER
	Q16	UN11004	IC PROTECTOR(0.4A)
	RL571	TSEH0012	RELAY
⚠	RL901	TSEH0010	RELAY
	S371	TAGA0005	SPARK GAP
	S671	TAGDSP141T	SPARK GAP
	S1051	TAGDSP141T	SPARK GAP
	S1151	TAGDSP141T	SPARK GAP
	S1251	TAGDSP141T	SPARK GAP
	S1351	TAGDSP141T	SPARK GAP
	S1355	TAGDSP201MF	SPARK GAP
	S1371	TAGA0005	SPARK GAP
⚠	SW801	ESB91274A	SWITCH(POWER)
	SW991	EVQ33405R	SWITCH
	SW992	EVQ33405R	SWITCH
	SW993	EVQ33405R	SWITCH
	SW994	EVQ33405R	SWITCH
	TH801	ERTB6SFL100P	THERMISTOR
⚠	TH901	TAP108M7R0	POSISTOR
	TP5	TEL302-9	TERMINAL
	X101	TAAA0005	CRYSTAL OSCILLATOR